E1.28:ONWI-119/app.

ONWI-119

ORIGINAL

Gulf Coast Salt Domes
Geologic Area Characterization Report
North Louisiana Study Area

Volume V
Appendix

July 1982

COMPLETED
270

Law Engineering Testing Company
2749 Delk Road, S.E.
Marietta, GA 30067

ONWI
Office of Nuclear Waste Isolation

BATTELLE Project Management Division

MV

BIBLIOGRAPHIC DATA

Law Engineering Testing Company, 1982. *Gulf Coast Salt Domes Geologic Area Characterization Report,* ONWI-119, Office of Nuclear Waste Isolation, Battelle Memorial Institute, Columbus, OH.

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Gulf Coast Salt Domes
Geologic Area Characterization Report
North Louisiana Study Area

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Appendix

July 1982

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Marietta, GA 30067

This report was prepared by Law Engineering Testing Company under Subcontract E512-00400 wi. Battelle Project Management Division, Office of Nuclear Waste Isolation under Contract No. DE-AC06-RLO1830-ONWI with the U.S. Department of Energy. This contract was administered by the Battelle Office of Nuclear Waste Isolation.

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LIST OF SUBCONTRACTED DATA CONTRIBUTORS

SUBCONTRACTOR/ CONSULTANT	TASK	STATE
Dr. J. Aghassy	Report - Geomorphic Expression of Salt Domes	TX, LA, MS
Amoco Production Co.	Downhole Velocity Surveys	LA
Ana-Log, Inc.	Mud Logging	TX
Analytical Logging, Inc.	Mud Logging	MS
Dr. S. Aronow	Report-Erosion and Alluviation	TX, LA, MS
Austin Exploration, Inc.	Field Gravity Surveys	LA, MS
Dr. J. Braunstein	Paleontological Reports-Area Characterization Deep Borings	MS
C. H. Burt, Inc.	Seismic Reflection Data Processing	TX, LA
Dr. E. S. K. Chian	Chemical Analyses of Salt Core	MS
Consolidated Lab.	Mud Logging	LA, MS
Core Laboratories, Inc.	Mud Logging; Determining Physical and Chemical Properties of Sidewall Cores	TX, LA, MS
Culpepper Testing Laboratories	Water and Gas Chemistry Analyses	MS
DDR International	Scheduling, Budget, and Cost Accounting	TX, LA, MS
Daedalus Enterprises, Inc.	Collected Thermal Infrared Image Data	TX, LA, MS
Dresser Industries, Inc.	Geophysical Well Logging	MS
Exploration Techniques, Inc.	Interpretation of Gravity Data and Salt Dome Modeling	TX, LA, MS
GTS Corporation	Seismic Data Broker	LA, MS
Dr. E. Gavish	Mineralogic Analysis of Field Samples	LA

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LIST OF SUBCONTRACTED DATA CONTRIBUTORS (Continued)

SUBCONTRACTOR/ CONSULTANT	TASK	STATE
Gearhart-Owen Wireline Services	Geophysical Well Logging	LA
Geo-Log, Inc.	Geophysical Well Logging	TX
Geomap Company	Structural Geologic Maps for Study Areas	TX, LA, MS
Geosource, Inc. Petty Ray Division	Seismic Data Broker	LA, MS
Dr. L. deA. Gimbrede	Paleontological Reports-Area Characterization Borings	LA
Griswold Engineering	Field Surveying	LA
Harris Aerial Surveys	Low Altitude Color Infrared Imagery and Black and White Aerial Photos	TX
Dr. W. C. Isphording	Report-Heavy Mineral Analyses of Shallow Boring Samples	MS
Dr. R. O. Kehle	Report-Salt Dome Growth Rate	TX, LA, MS
Dr. D. H. Kupfer	Report-Salt Dome Internal Structure	TX, LA, MS
Layne-Central Co.	Well Logging	MS
Location Sample Service, Inc.	Mud Logging	MS
Mark Hurd Surveys	Black and White Aerial Photos	LA
Dr. C. W. Meade	Report-Salt Exploitation of Rayburns Salt Dome Reports - Archeological Surveys	LA
Mr. F. F. Mellen	Report-Mineral Resources in Cypress Creek Domal Area	MS
Dr . W. R. Muehlberger	Report-Winnfield and Grand Saline Salt Mines	TX, LA

VOLUME V
LIST OF SUBCONTRACTED DATA CONTRIBUTORS (Continued)

SUBCONTRACTOR/ CONSULTANT	TASK	STATE
Dr. G. E. Murray	Report-Mineral Resources Near the Eight Candidate Domes	TX, LA MS
Dr. O. L. Paulson	Paleontological Reports-Area Characterization Borings	MS
Petrophysics, Inc.	Synthetic Seismograms	TX, LA, MS
Prokop Exploration, Inc.	Gravity Data Broker	LA
Richardson Seismic Services, Inc.	Seismic Data Broker	TX
Ridgways, Inc.	Geophysical Well Log Broker	TX, LA, MS
Dr. R. W. Rodgers	Report-Salt Dome Growth	TX, LA, MS
Schlumberger Well Services	Geophysical Well Logging	TX
Seismic and Digital Concepts, Inc.	Seismic Reprocessing	MS
Sigma Exploration, Ltd.	High Resolution Seismic Data Acquisition	MS
Southwestern Laboratories	Water Chemistry Analyses	LA
Teledyne Exploration	Seismic Data Broker	LA
Thompson & Associates, Inc.	Field Surveying	TX
United Aerial Mapping	Topographic Mapping	LA
University of Arizona	Radiocarbon Dating	LA
University of Southern Mississippi	Reports-Terrace Mapping Report-Salt Core Petrography	MS
Dr. J. R. Wadsworth, Jr.	Geomorphic Consultant	TX, LA

VOLUME V

LIST OF SUBCONTRACTED DATA CONTRIBUTORS (Continued)

SUBCONTRACTOR/ CONSULTANT	TASK	STATE
Dr. C. E. Weaver	Report-Clay Mineralogy of Shallow Boring Samples Report-Salt Core Petrology	MS
Dr. R. A. Welch	Report-Remote Sensing	LA, MS
Williams and Broom Surveyors	Field Surveying	MS
Willisco New Orleans, La.	Seismic Data Broker	MS
Willisco Houston, Tx.	Seismic Data Broker	TX

CONVERSION FACTORS

The conversion factors used in this report are based on the following table. In most instances, the metric-to-standard measurement conversions represent rounded-off figures in this report.

To convert from	To	Multiply by
millimeter (mm)	inch (in)	0.03937
meter (m)	foot (ft)	3.281
kilometer (km)	mile (mi)	0.6214
meter^2 (m^2)	foot^2 (ft^2)	10.76
kilometer^2 (km^2)	mile^2 (mi^2)	0.3861
hectare (-)	acre (-)	2.471
kilogram (kg)	pound (lb)	2.205
tonne (-)	ton (-)	0.893
liter (l)	gallon (gal)	0.2642
kilometers^3 (km^3)	miles^3 (mi^3)	0.244
kilopascal (kPa)	atmosphere (atm)	0.009869
milligrams per liter (mg/l)	parts per million (ppm)	1.0
liter per second (l/sec)	gallon per minute (gal/min)	15.85

ABBREVIATIONS AND ACRONYMS

AEC	Atomic Energy Commission
BEG	Texas Bureau of Economic Geology
BMI	Battelle Memorial Institute
BNI	Bechtel National, Inc.
DOE	Department of Energy
ERTS	Earth Resources Technology Satellite
FEA	Federal Energy Administration
LANDSAT	Earth Resources Technology Satellite (formerly ERTS)
LETCo	Law Engineering Testing Company
LSU/IES	Louisiana State University/Institute for Environmental Studies
MGAI	Mellen Geological Associates, Inc.
MM	Modified Mercalli
MMI	Modified Mercalli Intensity
MSGS	Mississippi State Geological Survey
MSL	Mean Sea Level
NAS	National Academy of Science
NRC	Nuclear Regulatory Commission
NSAI	Netherland, Sewell and Associates, Incorporated
NWTS	National Waste Terminal Storge
ONWI	Office of Nuclear Waste Isolation of Battelle Memorial Institute
ORNL	Oak Ridge National Laboratories
OWI	Office of Waste Isolation/Union Carbide Corp.
SCS	Soil Conservation Service
TAB	Technical Advisory Board
TNRIS	Texas Natural Resource Information System
USGS	United State Geological Survey
USM	University of Southern Mississippi

APPENDIX A

Borings

NORTH LOUISIANA STUDY AREA

APPENDIX A-1

DEEP BORING DATA

Eleven deep wells were drilled under the supervision of LETCo between December, 1979 and August, 1980, at five sites in the North Louisiana Study Area. The data from these wells, which were drilled to depths that range from 203 to 914 meters (667 to 3,000 ft), helped to provide a better understanding of the stratigraphy, lithology, and ground-water hydrology of the region.

A Deep Boring Data Summary from the deepest well at each of the five sites is presented in Tables A-1.1 through A-1.5, with their locations shown in Figure A-4.1. Included in the summaries are lithologic descriptions of drill cuttings and rock cores,* representative geophysical logs, and other pertinent data.

---

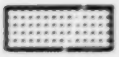
*Only units thicker than 3 meters (10 ft) are symbolized.

NORTH LOUISIANA STUDY AREA

APPENDIX A-1

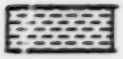
DEEP BORING DATA

KEY TO LITHOLOGIC SYMBOLS

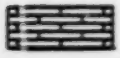


SAND

SILT OR SILTSTONE



CLAY, CLAYSTONE OR SHALE



LIMESTONE, DOLOMITE, OR CHALK

MARL OR MARLSTONE

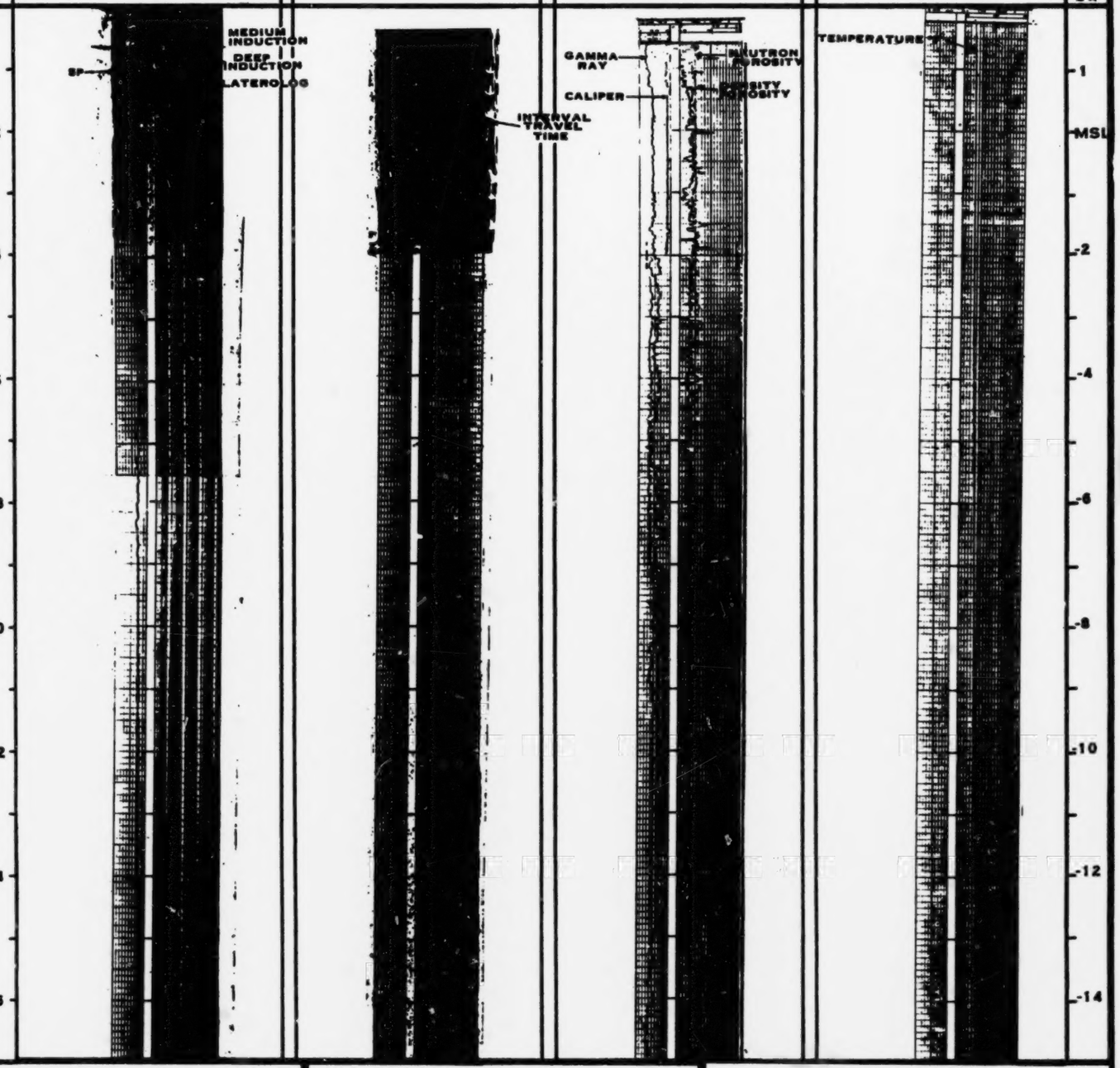
LIGNITE

BEST DOCUMENT AVAILABLE

GROUP	FORMATION	LITHOLOGY
CLAIBORNE	*1	SAND: LIGHT TO DARK YELLOWISH-BROWN, COLORLESS AND RED VERY FINE TO MEDIUM-GRAINED, ROUNDED TO SUBANGULAR, POORLY TO MODERATELY SORTED. SOME SUBANGULAR AND ROUNDED PEBBLES UP TO 20 MM IN DIAMETER. TOP TEN FEET OF SECTION CONSISTS OF:
	*2	SILTSTONE: YELLOWISH-BROWN, WHITE AND RED, FRIABLE TO LOOSELY CONSOLIDATED WITH TRACES OF KAOLINITE, IRONSTONE AND CARBONACEOUS MATTER.
	CANE RIVER	SAND: COLORLESS, LOCALLY BLACKENED, VERY FINE TO MEDIUM-GRAINED, WELL SORTED, ANGULAR TO SUBANGULAR WITH MINOR INTERBEDS OF LIGNITE, CLAY AND SILTSTONE. CLAYSTONE: DARK YELLOWISH-BROWN TO DARK BROWN, LOCALLY GRAY, PARTLY SILTY OR SANDY, BLOCKY, NON-FISSILE TO SUB-FISSILE WITH INTERBEDDED: DOLOMITE: LIGHT TO DARK BROWN, CRYPTOCRYSTALLINE, CHERTY, GLAUCONITIC.
WILCOX		CLAYSTONE: GRAY, SILTY, LOCALLY SANDY, BLOCKY, NONFISSILE, TO LOCALLY SUBFISSILE, SOFT TO INDURATED, MICACEOUS WITH LOCAL CARBONACEOUS MATTER, INTERBEDDED WITH: SILTSTONE: GRAY, LOCALLY SANDY, FRIABLE, NON-CALCAREOUS TO SLIGHTLY CALCAREOUS, MICACEOUS, WITH LOCAL CONCENTRATIONS OF CARBONACEOUS MATTER. SAND: LIGHT GRAY TO COLORLESS, VERY FINE TO MEDIUM-GRAINED, WELL TO MODERATELY SORTED, ANGULAR TO VERY ANGULAR, LOCALLY SILTY, LOCALLY WELL-CONSOLIDATED BY SILICEOUS CEMENT, LOCALLY MICACEOUS, LOCAL DISSEMINATED CARBONACEOUS MATTER LIMESTONE: YELLOW TO DARK BROWN, SILTY, CRYPTOCRYSTALLINE, DOLOMITIC. THIS IS A MINOR LITHOLOGY FOUND ONLY IN THE UPPER PORTION OF THE FORMATION
MIDWAY		CLAYSTONE: GRAY, GRADING INTO DARK GRAY WITH DEPTH, SILTY IN UPPER PORTION, BLOCKY, NON-FISSILE TO FISSILE, WITH DECREASING SILT AND INCREASING FISSILITY WITH DEPTH. UPPER PORTION CONTAINS INTERBEDDED: SANDSTONE: LIGHT YELLOW, VERY FINE TO FINE-GRAINED, MODERATELY TO WELL-SORTED, GLAUCONITIC WITH TRACES OF PYRITE, LIGNITE, CALCITE AND CHERTY DOLOMITE. MARLSTONE: GRAY, BLOCKY TO PLATY, NONFISSILE TO SUB-FISSILE, INDURATED TO SOFT, OCCURS IN LOWER 70 FEET OF FORMATION.
NAVARRO	*3	CHALK: WHITE WITH BEDS OF RECRYSTALLIZED, (MICROCRYSTALLINE, SPARRY CALCITE) MACROFOSSILS, ALSO WITH CLAY, SILT AND SAND IMPURITIES, AND INTERBEDS OF MARLSTONE AND SANDSTONE
	*4	

LITHOLOGIC SYMBOLS | CORED INTERVAL | SIDEWALL CORES | SCREENED INTERVAL | ELEVATION X 100 (FEET) | DEPTH X 100 (FEET)

DUAL INDUCTION LATEROLOG | BHC SONIC LOG | COMPENSATED DENSITY COMPENSATED NEUTRON LOG | DIFFERENTIAL TEMPERATURE LOG



ELEVATION (FT.): GL 199.57 KB 211.57 TOTAL DEPTH (FT.) 1850.00
DEPTH MEASUREMENTS ARE FROM GROUND LEVEL EXCEPT AS NOTED
LOCATION: NW/NW SEC. 3, T18N, R10W, WEBSTER PARISH, LA.
NOTES: *1 TERRACE DEPOSITS
*2 SPARTA FORMATION
*3 ARKADELPHIA FORMATION
*4 NACATOCH FORMATION

PREPARED Dyc DATE 2/13/81
REVISED ____ DATE ____
REVISED ____ DATE ____
APPROVED GHF DATE 2/12/81
T-1719-0

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX A-1
DEEP BORING DATA SUMMARY
DOE LOUISIANA POWER & LIGHT
LH-2
TABLE NO. A-1.1
JOB NO. MY9700 PAGE 1 OF 2

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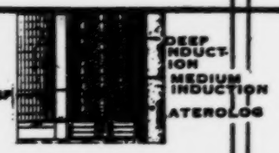
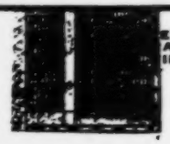
GROUP	FORMATION	LITHOLOGY	LITHOLOGIC SYMBOLS	CORED INTERVAL	SIDEWALL CORES	SCREENED INTERVAL	ELEVATION X 100 (FEET)	DEPTH X 100 (FEET)
NAVARRO	NACATOCH	SAND: GRAY, VERY FINE GRAINED, WELL-SORTED, ANGULAR LOCALLY GLAUCONITIC OR SILTY, CONTAINS INTERBEDS OF: MARLSTONE: DARK GRAY, SILTY, BLOCKY, NON-FISSILE MICACEOUS CHALK: WHITE, SILTY AND GLAUCONITIC LOWER 50 FEET OF FORMATION CONSISTS OF: SILTSTONE: LIGHT GRAY, SANDY, FRIABLE, WELL-TO LOOSELY-CONSOLIDATED, CALCAREOUS AND GLAUCONITIC WITH INTERBEDS OF COLORLESS, SILTY SAND AND MARLSTONE: LIGHT-BROWN, SILTY, BLOCKY TO PLATY, NON-FISSILE TO SUBFISSILE	TD				-16	18 TD

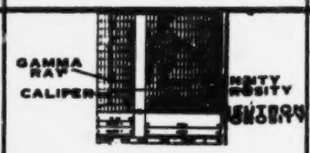
DUAL INDUCTION LATEROLOG



BHC SONIC LOG



COMPENSATED DENSITY COMPENSATED NEUTRON LOG



DIFFERENTIAL TEMPERATURE LOG

ELEVATION X 100 (FEET) -16

ELEVATION (FT.): GL 199.57 KB 211.57 TOTAL DEPTH (FT.) 1850.00
DEPTH MEASUREMENTS ARE FROM GROUND LEVEL EXCEPT AS NOTED
LOCATION: NW/NW SEC. 3, T18N, R10W, WEBSTER PARISH, LA.
HYDROLOGIC DATA: 1. ELEVATION OF BASE OF FRESH WATER: 150 FT. MSL
2. VARIATION IN TOTAL DISSOLVED SOLIDS WITH DEPTH:

SCREEN INTERVAL (FT. MSL)	TOTAL DISSOLVED SOLIDS (MG/L)
136 TO 93	310
-439 TO -441	3450
-1463 TO -1598	51000

PREPARED Frye DATE 2/13/81
REVISED ____ DATE ____
REVISED ____ DATE ____
APPROVED GHF DATE 2/13/81
T-1719-0

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX A-1
DEEP BORING DATA SUMMARY
DOE LOUISIANA POWER & LIGHT
LH-2
TABLE NO. A-1.1
PAGE 2 OF 2
JOB NO. MV8709

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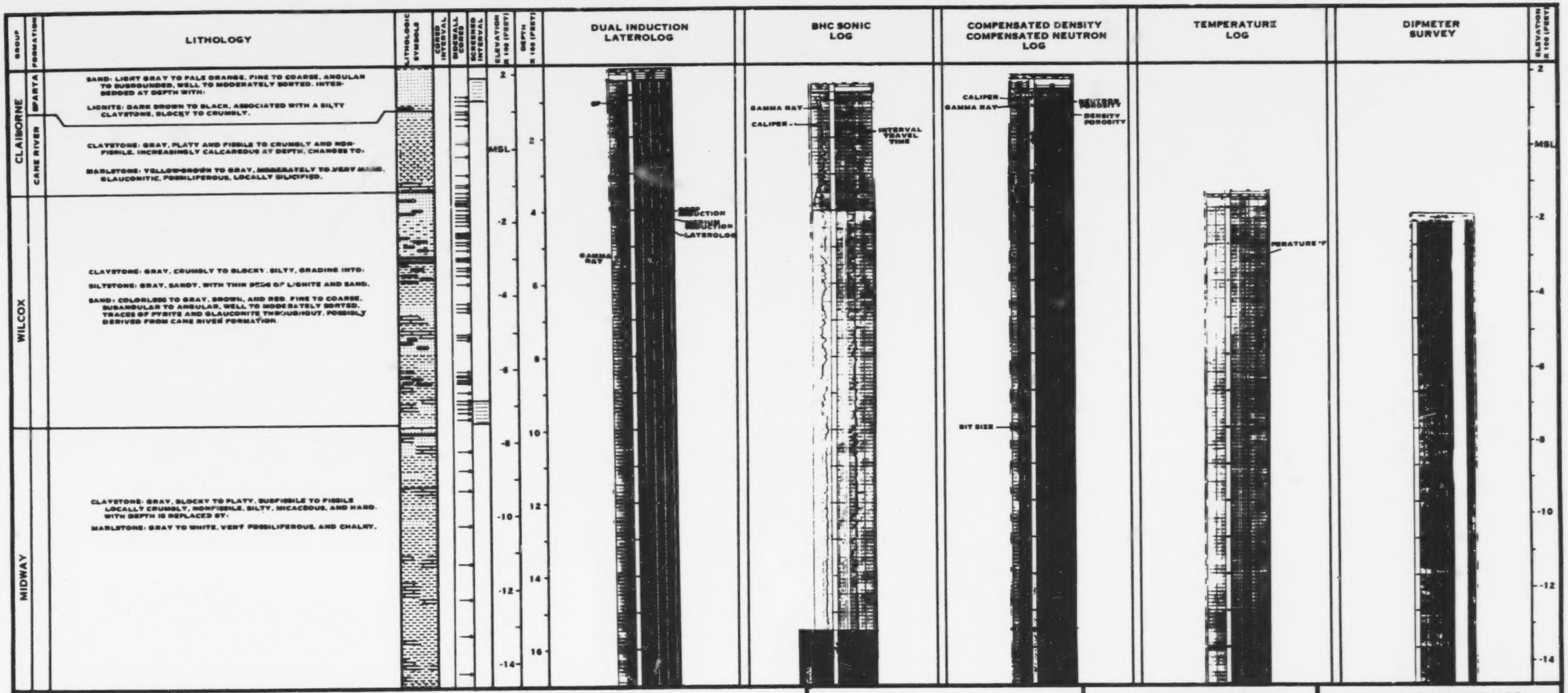

GROUP
FORMATION
LITHOLOGY
LITHOLOGIC SYMBOLS
CORED INTERVAL
BOREHOLE CORED
SCREENED INTERVAL
ELEVATION IN 100 (FEET)
DEPTH IN 100 (FEET)
DUAL INDUCTION LATEROLOG
BHC SONIC LOG
COMPENSATED DENSITY COMPENSATED NEUTRON LOG
TEMPERATURE LOG
DIPMETER SURVEY
CLAIBORNE
SPARTA
CANE RIVER
WILCOX
MIDWAY
SAND: LIGHT GRAY TO PALE ORANGE, FINE TO COARSE, ANGULAR TO SUBROUNDED, WELL TO MODERATELY SORTED, INTERBEDDED AT DEPTH WITH:
LIGNITE: DARK BROWN TO BLACK, ASSOCIATED WITH A SILTY CLAYSTONE, BLOCKY TO CRUMBLY.
CLAYSTONE: GRAY, PLATY AND FISSILE TO CRUMBLY AND NONFISSILE, INCREASINGLY CALCAREOUS AT DEPTH, CHANGES TO:
MARLSTONE: YELLOWBROWN TO GRAY, MODERATELY TO VERY HARD, GLAUCONITIC, FORAMINIFEROUS, LOCALLY SILICIFIED.
CLAYSTONE: GRAY, CRUMBLY TO BLOCKY, SILTY, GRADING INTO:
SILTSTONE: GRAY, SANDY, WITH THIN BEDS OF LIGNITE AND SAND.
SAND: COLORLESS TO GRAY, BROWN, AND RED, FINE TO COARSE, SUBANGULAR TO ANGULAR, WELL TO MODERATELY SORTED, TRACES OF PYRITE AND GLAUCONITE THROUGHOUT, POSSIBLY DERIVED FROM CANE RIVER FORMATION.
CLAYSTONE: GRAY, BLOCKY TO PLATY, SUBFISSILE TO FISSILE LOCALLY CRUMBLY, NONFISSILE, SILTY, MICACEOUS, AND HARD. WITH DEPTH IS REPLACED BY:
MARLSTONE: GRAY TO WHITE, VERY FORAMINIFEROUS, AND CHALKY.
GAMMA RAY
CALIPER
INTERVAL TRAVEL TIME
DENSITY POROSITY
BIT SIZE
MSL

ELEVATION (FT.): GL 223.16 KB ——— TOTAL DEPTH (FT.) 3000.00
DEPTH MEASUREMENTS ARE FROM GROUND LEVEL EXCEPT AS NOTED
LOCATION: NW/SW SEC. 35, T17N, R8W, BIENVILLE PARISH, LA. (VACHERIE DOME)

PREPARED Gaye DATE 2/13/81
REVISED ——— DATE ———
REVISED ——— DATE ———
APPROVED GHF DATE 2/13/81
T-1720-0

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX A-1
DEEP BORING DATA SUMMARY
DOE CONTINENTAL FOREST INDUSTRIES LVH-6
TABLE NO. A-1.2
JOB NO. MV9709 PAGE 1 OF 2

BEST DOCUMENT AVAILABLE

GROUP	FORMATION	LITHOLOGY
NAVARRO	*1	MARLSTONE: LIGHT GRAY TO WHITE, VERY FOSSILIFEROUS, CHALKY, GRADES INTO:
	*2	LIMESTONE AND CHALK: YELLOW, CRYPTOCRYSTALLINE TO MICROCRYSTALLINE.
	NACATOCH	SAND: LIGHT GRAY, VERY FINE, WELL SORTED, ANGULAR TO SUB-ANGULAR, LOCAL CALCAREOUS CEMENTATION INTO FRIABLE TO HARD SANDSTONE, GLAUCONITIC, PYRITIC, MICACEOUS, GRADES INTO:
	*3	SILTSTONE: LIGHT GRAY, MEDIUM TO COARSE, FOSSILIFEROUS, CALCAREOUS, GLAUCONITIC, PYRITIC, AND MICACEOUS; LOCALLY CHALKY, WITH SPARRY CALCITE.
TAYLOR	MARL-BROOK	CHALK: LIGHT GRAY TO WHITE, FOSSILIFEROUS, WITH SPARRY CALCITE, QUARTZ SAND AND CLAY MINERALS. UPPER PART OF FORMATION IS SILTY AND GRADES INTO:
		SILTSTONE: LIGHT GRAY TO YELLOWISH GRAY, HARD TO FRIABLE, CALCAREOUS, LOCALLY GRADES INTO:
		MARLSTONE: LIGHT GRAY,
	AN-NONA	MARLSTONE: GRAY, BLOCKY TO CRUMBLY AND NONFISSILE, CHALKY, TRACES OF PYRITE, QUARTZ, AND FOSSILS. LOCALLY SILTY.
		CHALK: WHITE TO LIGHT GRAY OR YELLOW, WITH SPARRY CALCITE, FOSSILS, QUARTZ, SILTSIZED ARGILLACEOUS MATTER, PYRITE, CHALCOPYRITE AND DISSEMINATED CARBONACEOUS MATTER LOCALLY GRADES INTO MARLSTONE.
	OZAN	MARLSTONE: GRAY, CHALKY TO SILTY, BLOCKY OR PLATY TO CRUMBLY. UPPER PORTION OF FORMATION CONTAINS INTERBEDDED:
		SILTSTONE AND SILTY LIMESTONE: LIGHT GRAY, MEDIUM TO COARSE, TRACES OF GLAUCONITE AND CHALCOPYRITE.
AUSTIN		SAND: COLORLESS TO BROWN, FINE TO COARSE, ANGULAR TO ROUNDED, WELL TO MODERATELY SORTED, SLIGHTLY GLAUCONITIC.
		SANDSTONE: GRAY TO BROWN, FINE TO MEDIUM, ANGULAR TO SUB-ANGULAR, WELL SORTED, MODERATELY HARD TO HARD, AND CALCAREOUS. TRACES OF CALCAREOUS SILTSTONE, AND SANDY, SILTY, LIMESTONE.
		MARLSTONE: GRAY, BLOCKY TO PLATY, SUBFISSILE TO FISSILE, MICACEOUS, FOSSILIFEROUS, LOCALLY SILTY, GRADES INTO:
		CLAYSTONE: GRAY, SOFT TO INDURATED, WITH TRACES OF PYRITE, CHALCOPYRITE, DISSEMINATED CARBONACEOUS MATTER, AND LIGNITE. AT DEPTH CONTAINS INTERBEDDED:
		LIMESTONE: GRAY, MICROCRYSTALLINE, ARGILLACEOUS.
		TD

LITHOLOGIC SYMBOLS | CORED INTERVAL | SIDEWALL CORES | SCREENED INTERVAL | ELEVATION (X 100 FEET) | DEPTH (X 100 FEET)

DUAL INDUCTION LATEROLOG — GAMMA RAY — LATEROLOG — MEDIUM INDUCTION — DEEP INDUCTION

BHC SONIC LOG — GAMMA RAY — INTERVAL TRAVEL TIME

COMPENSATED DENSITY COMPENSATED NEUTRON LOG — CALIPER — GAMMA RAY — NEUTRON POROSITY — DENSITY POROSITY

TEMPERATURE LOG — TEMPERATURE

DIPMETER SURVEY

ELEVATION (FT.): GL 223.16 KB ——— TOTAL DEPTH (FT.) 3000.00
DEPTH MEASUREMENTS ARE FROM GROUND LEVEL EXCEPT AS NOTED
LOCATION: NW/SW SEC. 35, T17N, R8W, BIENVILLE PARISH, LA. (VACHERIE DOME)
HYDROLOGIC DATA: 1. ELEVATION OF BASE OF FRESH WATER: -837 FT. MSL
2. VARIATION IN TOTAL DISSOLVED SOLIDS WITH DEPTH:

SCREEN INTERVAL (FT. MSL)	TOTAL DISSOLVED SOLIDS (MG/L)
100 TO 138	83
-684 TO -748	3880
-1604 TO -1693	218,000
-2314 TO -2474	139,000

NOTE:
*1 MIDWAY GROUP
*2 ARKADELPHIA FORMATION
*3 SARATOGA FORMATION

PREPARED Pope DATE 2/13/81
REVISED ——— DATE ———
REVISED ——— DATE ———
APPROVED GHF DATE 2/18/81
T-1720-0

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX A-1
DEEP BORING DATA SUMMARY
DOE CONTINENTAL FOREST INDUSTRIES
LVH-6
TABLE NO. A-1.2
JOB NO. MY9709 PAGE 2 OF 2

BEST DOCUMENT AVAILABLE

GROUP	FORMATION	LITHOLOGY
CLAIBORNE	*1	SAND: COLORLESS TO LIGHT BROWN, VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, ARGILLACEOUS WITH INTERCALETED:
	*2	CLAY: BROWNISH YELLOW TO LIGHT GRAY, LOCALLY SILTY
	SPARTA	CLAYSTONE: BROWNISH GRAY, SILTY, LOCALLY SANDY, BLOCKY TO FLATY AND SUBFISSILE WITH LOCAL PYRITE NODULES. FOSSILIFEROUS WITH THIN INTERBEDS OF SAND: GRAYISH-OLIVE-GREEN, FINE TO MEDIUM, GLAUCONITIC AND DOLOMITE: YELLOWISH TO DARK-BROWN, HARD, HACKLY, CHERTY SAND: COLORLESS TO LIGHT-GRAY, FINE TO MEDIUM-GRAINED, ANGULAR WITH FINE TO COARSE GLAUCONITE GRAINS WITH TRACES OF PYRITE, CARBONACEOUS MATTER, AND FOSSIL FRAGMENTS. GRADING INTO: SILTSTONE: MEDIUM GRAY, ARGILLACEOUS CLAYSTONE: DARK GRAY TO BROWNISH GRAY, SILTY, SANDY WITH THIN INTERBEDS OF LIGNITE AND CHERTY DOLOMITE
	CANE RIVER	CLAYSTONE: BROWNISH GRAY, BLOCKY, LAMELLAR, NONFISSILE TO SOFT, SLIGHTLY MICACEOUS AND CALCAREOUS GRADING INTO: SILTSTONE: BROWNISH GRAY, ARGILLACEOUS, SANDY, BECOMING LIGHTER AND SLIGHTLY CALCAREOUS AT DEPTH, LOCALLY VERY GLAUCONITIC AND FOSSILIFEROUS, WITH FEW THIN BEDS OF SANDY DOLOMITE. BECOMES CALCAREOUS AND HARDER WITH FEWER INTERBEDS AT DEPTH, GRADING INTO VERY FOSSILIFEROUS, SILTY LIMESTONE. PYRITE NODULES SCATTERED THROUGHOUT FORMATION.
WILCOX		SAND: COLORLESS, VERY FINE TO VERY COARSE-GRAINED, SUBANGULAR TO ANGULAR, MODERATELY POORLY SORTED, SILTY, WITH LOCAL INTERCALATED CLAYSTONE. BECOMING MORE SILTY AND CLAYEY BELOW 1100 FEET WITH CARBONACEOUS CLAYS, LIGNITE BEDS, AND LOCAL MARLSTONE AND DOLOMITIC, SILTY, LIMESTONE LAMINAE.
MIDWAY		CLAYSTONE: DARK-GRAY SLIGHTLY CALCAREOUS, SUBFISSILE TO FISSILE, BLOCKY TO PLATY, AND MICACEOUS UPPER PORTION OF FORMATION IS SILTY AND CALCAREOUS WITH INTERCALATED LIMESTONE

LITHOLOGIC SYMBOLS | CORED INTERVAL | SIDEWALL CORES | SCREENED INTERVAL

ELEVATION X 100 (FEET): +2, MSL, -2, -4, -6, -8, -10, -12

DEPTH X 100 (FEET): 2, 4, 6, 8, 10, 12, 14, 16

DUAL INDUCTION LATEROLOG

BHC SONIC LOG

GAMMA RAY

COMPENSATED DENSITY COMPENSATED NEUTRON LOG

CALIPER

GAMMA RAY

TEMPERATURE LOG

65 165

TEMPERATURE

ELEVATION X 100 (FEET): +2, MSL, -2, -4, -6, -8, -10, -12

ELEVATION (FT.): GL 325.57 KB — TOTAL DEPTH (FT.) 2618.76
DEPTH MEASUREMENTS ARE FROM GROUND LEVEL EXCEPT AS NOTED
LOCATION: SW/SW, SEC. 5, T17N, R5W, BIENVILLE PARISH, LA.
NOTES: *1. TERRACE DEPOSITS
*2. COOK MOUNTAIN FORMATION
*3. ARKADELPHIA FORMATION
*4. SARATOGA FORMATION
*5. MARLBROOK FORMATION

PREPARED Inge DATE 2/13/81
REVISED ____ DATE ____
REVISED ____ DATE ____
APPROVED GHF DATE 2/13/81

T-1721-0

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX A-1
DEEP BORING DATA SUMMARY
DOE CONTINENTAL FOREST INDUSTRIES
LH-7

JOB NO. MV9700

TABLE NO. A-1.3
PAGE 1 OF 2

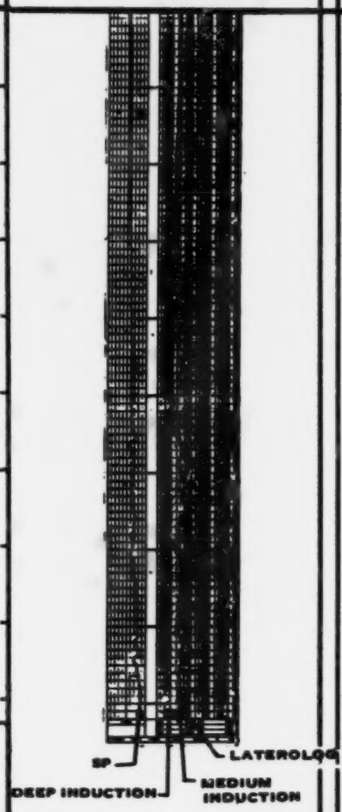
BEST DOCUMENT AVAILABLE

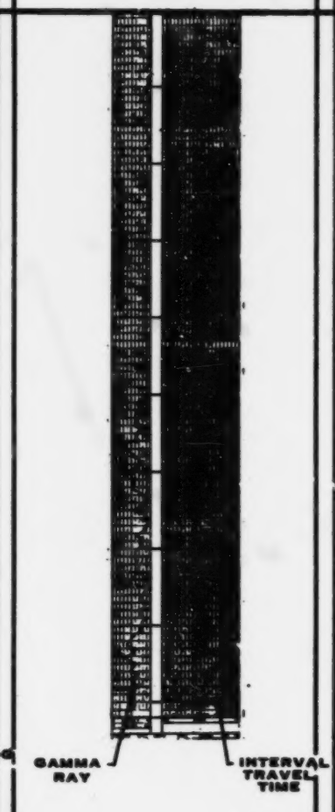
GROUP	FORMATION	LITHOLOGY
MIDWAY	MIDWAY	SEE PRECEEDING PAGE
NAVARRO	#3	MARLSTONE: LIGHT TO MEDIUM GRAY, PLATY, FISSILE, INDURATED TO SOFT, VERY FOSSILIFEROUS CHALK: LIGHT GRAY TO WHITE, ARGILLACEOUS, SILTY, FOSSILIFEROUS, SOFT TO VERY HARD
	NACATOCH	SILTSTONE: LIGHT TO MEDIUM GRAY, FRIABLE, CALCAREOUS, MICACEOUS, LOCALLY GLAUCONITIC WITH DISSEMINATED CARBONACEOUS MATTER AND FOSSIL FRAGMENTS. MINOR INTERBEDS OF CHALK, CLAYSTONE AND SAND.
	#2	CHALK: WHITE TO LIGHT GRAY, LOCALLY ARGILLACEOUS OR SILTY, SOFT TO INDURATED, FOSSILIFEROUS, LOCALLY GLAUCONITIC WITH INTERBEDS OF MARLSTONE AND CLAYSTONE.
TAYLOR	#1	MARLSTONE: LIGHT GRAY, BLOCKY, FOSSILIFEROUS, SOFT TO INDURATED, LOCALLY SILTY, CHALKY, LOCAL DISSEMINATED PYRITE CRYSTALS
		TD

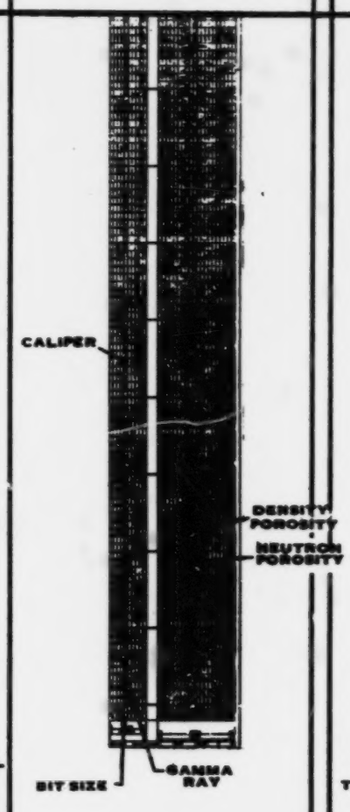
LITHOLOGIC SYMBOLS | CORED INTERVAL | SIDEWALL CORES | SCREENED INTERVAL | ELEVATION X 100 (FEET) | DEPTH X 100 (FEET)

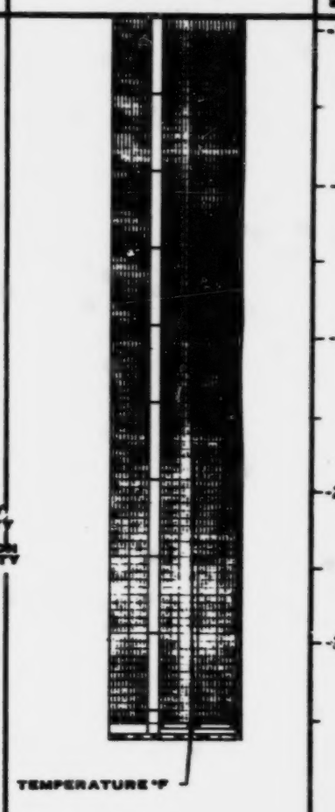
ELEVATION X 100 (FEET): -14, -16, -18, -20, -22

DEPTH X 100 (FEET): 18, 20, 22, 24, 26, TD









ELEVATION (FT.): GL 325.57 KB — TOTAL DEPTH (FT.) 2618.76
DEPTH MEASUREMENTS ARE FROM GROUND LEVEL EXCEPT AS NOTED
LOCATION: SW/SW, SEC. 5, T17N, R5W, BIENVILLE PARISH, LA.
HYDROLOGIC DATA: 1. ELEVATION OF BASE OF FRESH WATER: -365 FT. MSL
2. VARIATION IN TOTAL DISSOLVED SOLIDS WITH DEPTH:

SCREEN INTERVAL (FT. MSL)	TOTAL DISSOLVED SOLIDS (MG/L)
-147 TO -266	219
-617 TO -721	2466
-1184 TO -1238	6798

PREPARED Dwc DATE 2/13/81
REVISED — DATE —
REVISED — DATE —
APPROVED GHF DATE 2/13/81

T-1721-0

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX A-1
DEEP BORING DATA SUMMARY
DOE CONTINENTAL FOREST INDUSTRIES
LH-7
TABLE NO. A-1.1
JOB NO. MY9700 PAGE 2 OF 2

BEST DOCUMENT AVAILABLE

GROUP	FORMATION	LITHOLOGY
CLAIBORNE	SPARTA	SAND: COLORLESS TO BROWN, FINE TO COARSE, ANGULAR TO WELL-ROUNDED, MODERATELY TO WELL SORTED, WITH MINOR MICA, GLAUCONITE, PYRITE. LOCAL EXTENSIVE IRON CEMENTATION WITH INTERBEDDED MINOR LIGNITE AND CLAYSTONE: GRAY TO ORANGE-PINK, LOCALLY SANDY OR SILTY
	CANE RIVER	CLAYSTONE: GRAY TO LIGHT BROWN, FISSILE TO SUBFISSILE, ARGILLACEOUS, CALCAREOUS, WITH TRACES OF MICA, GLAUCONITE, AND CARBONACEOUS MATTER GRADES INTO: MARLSTONE: YELLOW-BROWN TO LIGHT GRAY, CRUMBLY, NON-FISSILE LOCALLY VERY GLAUCONITIC OR FOSSILIFEROUS WITH INTERBEDDED: DOLOMITE: BROWN, CRYPTOCRYSTALLINE TO MICROCRYSTALLINE, MOSTLY VITREOUS, BLOCKY, HACKLY, VERY HARD, LOCALLY SLIGHTLY GLAUCONITIC. SILTSTONE: LIGHT GRAY, FRIABLE, MODERATELY HARD, VERY CALCAREOUS WITH ABUNDANT PYRITE, MARCASITE AND CHALCOPYRITE IN LOWER 20 FEET.
WILCOX		SAND: COLORLESS TO BROWNISH-GRAY, VERY FINE TO MEDIUM, ANGULAR TO SUBANGULAR, WELL TO MODERATELY SORTED, WITH DISSEMINATED MINOR PYRITE, CARBONACEOUS MATTER, GLAUCONITE AND MICA. INTERBEDDED WITH THE FOLLOWING: SILTSTONE: GRAY, MODERATELY HARD, ARGILLACEOUS, SANDY WITH TRACES OF MICA, GLAUCONITE, AND CARBONACEOUS MATTER. MARLSTONE: GRAY, PLATY TO BLOCKY AND SUBFISSILE, LOCALLY SILTY, GLAUCONITIC, FOSSILIFEROUS LIGNITE: DARK BROWN TO BLACK, USUALLY ASSOCIATED WITH CARBONACEOUS SILTY CLAYSTONE. LIMESTONE: GRAY TO BROWN OR GREENISH, MICROCRYSTALLINE TO VERY FINE CRYSTALLINE, WITH MINOR QUARTZ AND GLAUCONITE GRAINS. GRADES INTO A WELL-CONSOLIDATED, HARD SANDSTONE. DOLOMITE: GRAYISH-RED TO BROWN, MICROCRYSTALLINE TO VERY FINE CRYSTALLINE, BLOCKY, HACKLY. CLAYSTONE: LIGHT TO DARK GRAY, CRUMBLY, NON-FISSILE, SILTY, SLIGHTLY CALCAREOUS, GLAUCONITIC, PYRITIC, AND CARBONACEOUS.
*1		CLAYSTONE: DARK GRAY, PLATY, FISSILE, PARTLY SILTY, LOCALLY GRADING INTO: SILTSTONE: GRAY, FRIABLE, ARGILLACEOUS. BOTH UNITS HAVE MINOR, INTERBEDDED DOLOMITE WITH TRACES OF GLAUCONITE AND PYRITE, AND THINLY INTERBEDDED LIGNITE AND SAND BEDS.

LITHOLOGIC SYMBOLS | CORED INTERVAL | SIDEWALL CORES | SCREENED INTERVAL | ELEVATION X 100 (FEET) | DEPTH X 100 (FEET)

TD

DUAL INDUCTION LATEROLOG

GAMMA RAY

SP

DEEP INDUCTION

MEDIUM INDUCTION LATEROLOG

BHC SONIC LOG

GAMMA RAY

INTERVAL TRAVEL TIME

COMPENSATED DENSITY COMPENSATED NEUTRON LOG

DENSITY POROSITY

NEUTRON POROSITY

GAMMA RAY

CALIPER

BIT SIZE

DIFFERENTIAL TEMPERATURE LOG

TEMPERATURE °F

DIPMETER

ELEVATION X 100 (FEET)

+2 | MSL | -2 | -4 | -6 | -10 | -12

ELEVATION (FT.): GL 241.65 KB 253.65 TOTAL DEPTH (FT.) 1484.77

DEPTH MEASUREMENTS ARE FROM GROUND LEVEL EXCEPT AS NOTED.

LOCATION: SE/SW, SEC. 1, T14N, R6W, BIENVILLE PARISH, LA. (RAYBURNS DOME)

HYDROLOGIC DATA: 1. ELEVATION OF BASE OF FRESH WATER: -1047 FT. MSL
2. VARIATION IN TOTAL DISSOLVED SOLIDS WITH DEPTH:

SCREEN INTERVAL (FT. MSL)	TOTAL DISSOLVED SOLIDS (MG/L)
160 TO 68	88
-333 TO -431	448
-888 TO-974	456

NOTE: *1 MIDWAY GROUP

PREPARED Smyc DATE 2/13/81
REVISED _____ DATE _____
REVISED _____ DATE _____
APPROVED GHF DATE 2/13/81

T-1722-0

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX A-1
DEEP BORING DATA SUMMARY
DOE CONTINENTAL FOREST INDUSTRIES
LRH-13

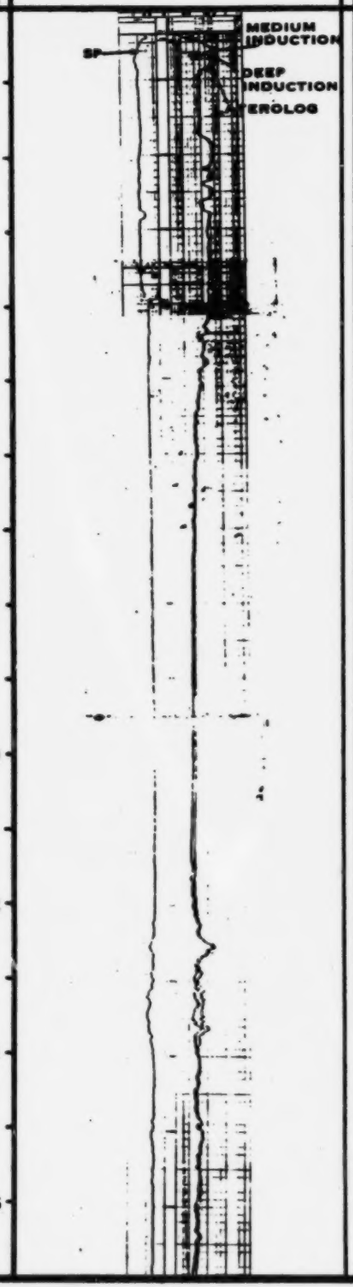
TABLE NO. A-1.4
JOB NO. MV8700 PAGE 1 OF 1

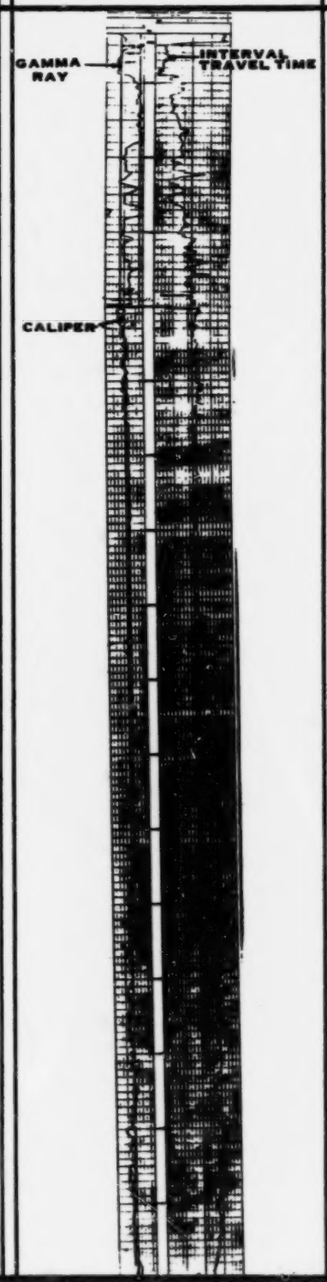
[redacted]

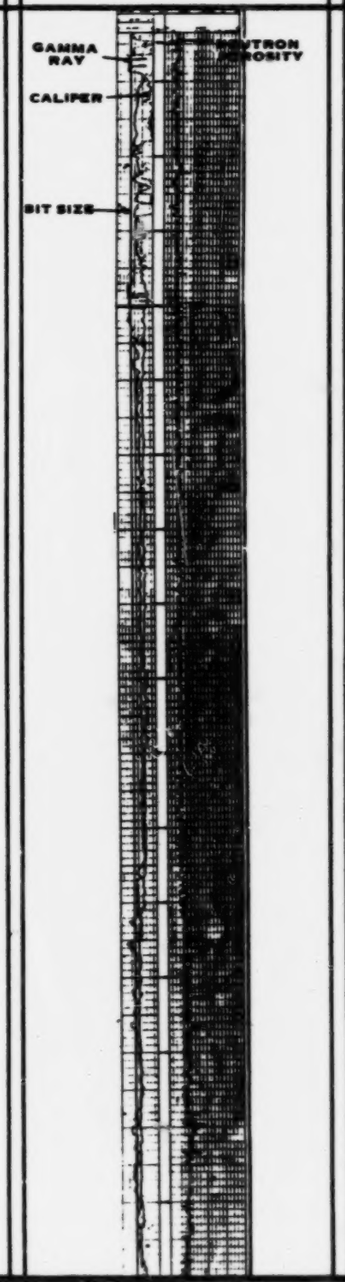
BEST DOCUMENT AVAILABLE

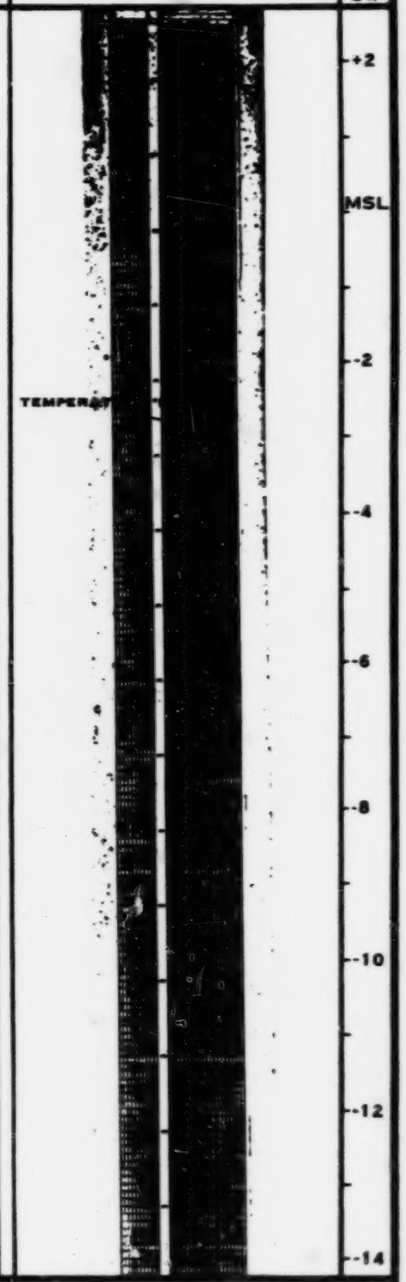
GROUP	FORMATION	LITHOLOGY
WILCOX		SAND: BROWNISH GRAY TO COLORLESS; VERY FINE TO VERY COARSE, ANGULAR TO ROUNDED, MODERATELY TO WELL SORTED, MICACEOUS LOCALLY GLAUCONITIC WITH DISSEMINATED CARBONACEOUS MATTER, SOMETIMES ACCUMULATING AS LIGNITE BEDS. SANDSTONE: LIGHT GRAY, VERY FINE TO FINE, ANGULAR TO SUBANGULAR, WELL SORTED, FRIABLE TO HARD, MICACEOUS, GLAUCONITIC CLAYSTONE: LIGHT TO BROWNISH GRAY, BLOCKY, SUBFISSILE, SILICEOUS, GRADES INTO SILTSTONE. THE SILTSTONE IS ARGILLACEOUS, CALCAREOUS, AND GRADES INTO A MICROCRYSTALLINE LIMESTONE. LIGNITE: BLACK TO DARK BROWN, OCCURRING IN LENSES
MIDWAY		CLAYSTONE: DARK-TO BROWN-GRAY, BLOCKY TO PLATY SUBFISSILE TO FISSILE, LOCALLY CRUMBLY NONFISSILE, NON-CALCAREOUS TO SLIGHTLY CALCAREOUS WITH DEPTH.
NAVARRO	*1 NACATOCH	MARLSTONE: LIGHT TO OLIVE-GRAY, BLOCKY TO CRUMBLY, NONFISSILE TO SUBFISSILE, CHALKY, LOCALLY LESS CALCAREOUS, GRADES INTO: CLAYSTONE: BROWNISH GRAY, BLOCKY, SUBFISSILE. LIMESTONE: WHITE, CRYPTOCRYSTALLINE TO MICROCRYSTALLINE FOSSILIFEROUS, CONTAINS THIN BEDS OF CHALK SAND: LIGHT GRAY TO COLORLESS, ANGULAR, WELL TO MODERATELY SORTED WITH SOME VERY COARSE SILT, FRIABLE TO MODERATELY HARD, SLIGHTLY GLAUCONITIC, CONSOLIDATED BY CHALKY MATRIX, INTERBEDDED WITH: MARLSTONE: GRAY, CHALKY, FOSSILIFEROUS; LOCALLY GRADING INTO CHALK, FOSSILIFEROUS LIMESTONE, AND CLAYSTONE.
TAYLOR	*2 MARLBROOK	MARLSTONE: VERY LIGHT GRAY TO WHITE, CRUMBLY TO BLOCKY AND NON-FISSILE, CHALKY, FOSSILIFEROUS LOCALLY GRADING TO CHALK. MARLSTONE: LIGHT GRAY TO OLIVE GRAY, BLOCKY TO PLATY, NON-FISSILE TO FISSILE, FOSSILIFEROUS, MICACEOUS WITH DISSEMINATED CARBONACEOUS MATTER, LOCALLY CHALKY.

LITHOLOGIC SYMBOLS | CORED INTERVAL | SIDEWALL CORES | SCREENED INTERVAL | ELEVATION X 100 (FEET) | DEPTH X 100 (FEET)









ELEVATION (FT.): GL 270.00 KB 272.00 TOTAL DEPTH (FT.) 2400.00
DEPTH MEASUREMENTS ARE FROM GROUND LEVEL EXCEPT AS NOTED
LOCATION: NE/SE, SEC. 12, T15N, R10W, BIENVILLE PARISH, LA.
NOTES: *1 ARKADELPHIA FORMATION
*2 SARATOGA FORMATION

PREPARED Jmjc DATE 2/13/81
REVISED ____ DATE ____
REVISED ____ DATE ____
APPROVED GHF DATE 2/13/81
T-1723-0

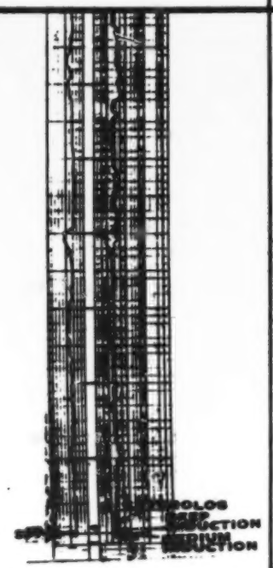
NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX A-1
DEEP BORING DATA SUMMARY
DOE CONTINENTAL FOREST INDUSTRIES
LH-17
TABLE NO. A-1.5
JOB NO. MV9700 PAGE 1 OF 2

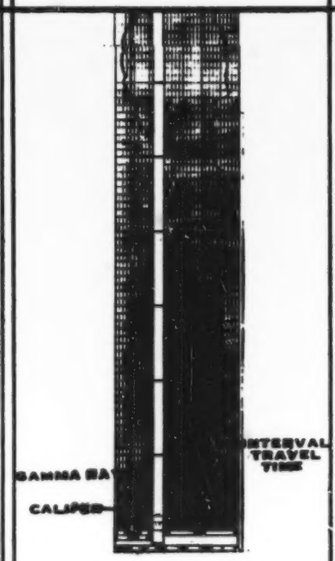
BEST DOCUMENT AVAILABLE

GROUP	FORMATION	LITHOLOGY	LITHOLOGIC SYMBOLS	CORED INTERVAL	SIDEWALL CORES	SCREENED INTERVAL	ELEVATION X 100 (FEET)	DEPTH X 100 (FEET)
TAYLOR	ANNONA	CHALK: WHITE TO LIGHT GRAY, INDURATED TO SOFT, VERY FOSSILIFEROUS						
	OZAN	MARLSTONE: GRAY, BLOCKY TO PLATY, SUBFISSILE TO FISSILE (LOCALLY CRUMBLY AND NON-FISSILE), INDURATED TO SOFT, FOSSILIFEROUS. INTERBEDDED WITH THE FOLLOWING: SILTSTONE: MEDIUM TO LIGHT GRAY, COARSE TO VERY COARSE, ANGULAR, CALCAREOUS, SLIGHTLY GLAUCONITIC AND PYRITIC. CHALK: MEDIUM TO LIGHT GRAY, VERY FOSSILIFEROUS					-16	18
AUSTIN		SAND: LIGHT GRAY TO GRAYISH GREEN, VERY FINE TO MEDIUM, ANGULAR, WELL TO MODERATELY SORTED, GLAUCONITIC, LOCALLY CALCAREOUSLY CEMENTED TO FORM MODERATELY HARD TO FRIABLE GLAUCONITIC, SANDSTONE. INTERBEDDED WITH CLAYSTONE AND FOSSILIFEROUS, MARLSTONE AND CHALK.					-18 -20	20 22
			TD					24 TD

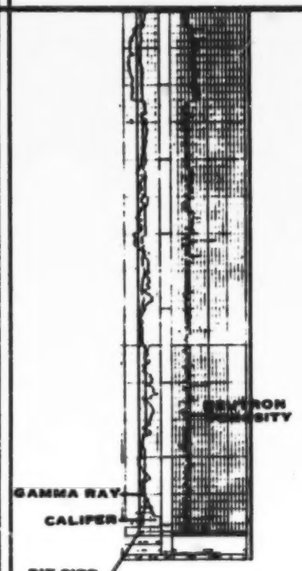
DUAL INDUCTION LATEROLOG



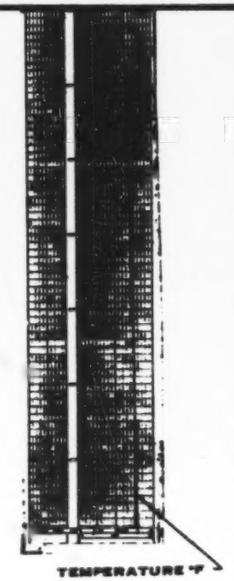
BHC SONIC LOG



COMPENSATED DENSITY COMPENSATED NEUTRON LOG



TEMPERATURE LOG



ELEVATION (FT.): GL 270.00 KB 272.00 TOTAL DEPTH (FT.) 2400.00
DEPTH MEASUREMENTS ARE FROM GROUND LEVEL EXCEPT AS NOTED
LOCATION: NE/SE, SEC. 12, T15N, R10W, BIENVILLE PARISH, LA.
HYDROLOGIC DATA: 1. ELEVATION OF BASE OF FRESH WATER: -210 FT. MSL.
2. VARIATION IN TOTAL DISSOLVED SOLIDS WITH DEPTH:

SCREEN INTERVAL (FT. MSL)	TOTAL DISSOLVED SOLIDS (MG/L)
-84 TO -186	230
-1042 TO -1103	29,300
-1734 TO -1783	44,000

PREPARED Myt DATE 2/13/81
REVISED ____ DATE ____
REVISED ____ DATE ____
APPROVED GHE DATE 2/13/81
T-1723-0

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX A-1
DEEP BORING DATA SUMMARY
DOE CONTINENTAL FOREST INDUSTRIES
LH-17
TABLE NO. A-1.5
JOB NO. MV9700
PAGE 2 OF 2

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NORTH LOUISIANA STUDY AREA

APPENDIX A-2

SHALLOW-BORING DATA

The near-surface stratigraphy and structural geology in the vicinity of Vacherie and Rayburn's Domes were characterized by using interpretations by Louisiana State University/Institute for Environmental Studies (LSU/IES) of data collected in shallow borings, in combination with interpretations of electrical resistivity data collected by Law Engineering Testing Company (LETCo) (See Appendices E-1 and E-2). For the interpretations of the shallow-boring data, refer to the LSU/ IES annual reports (Martinez and others, 1975, 1976, 1977, 1978, 1979).

APPENDIX A-2

REFERENCES

Martinez, J. D., and others, 1975, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report ORNL-Sub-4112-10, 204 p.

Martinez, J. D., and others, 1976, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report ORNL-Sub-4112-15, 329 p.

Martinez, J. D., and others, 1977, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report Y/OWI/Sub-4112/37, 475 p.

Martinez, J. D., and others, 1978, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report EW-78-C-05-5941/53, 700 p.

Martinez, J. D., and others, 1979, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies, Annual Report, 572 p.

NORTH LOUISIANA STUDY AREA

APPENDIX A-3

NEAR-DOME WELL DATA

A tabulation of the hydrocarbon wells and Area Characterization wells within a 8-km (5-mi) radius of Vacherie and Rayburn's Domes is presented in Tables A-3.1 and A-3.2, respectively, and the well locations are shown in Figures A-3.1 and A-3.2. Data for wells within the -914-meter (-3,000-ft) MSL salt contours of the two domes are presented in Tables 10-1 and 10-2 and the well locations are shown in Figures 10-2 and 10-20 of Volume IV.

Geophysical log data and Louisiana Department of Conservation records were used to determine well locations. Information concerning the total depth of the wells, stratigraphic horizons at termination, and logged intervals was obtained from geophysical logs, scout cards, and Louisiana Department of Conservation completion reports.

NORTH LOUISIANA STUDY AREA

APPENDIX A-3

TABLE A-3.1 (Page 1 of 7)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF VACHERIE DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
B-81	ROBERTS #1 Ratliff	7203	Hosston	724-7197
B-82	MONTGOMERY #1 Davis	7953	Hosston	759-7947
B-85	FRANKS & PETROFUNDS & TRIDENT #2 Ryan	5915	James	546-5914
B-94	UNION #1 Woodard-Walker	6313	James	1006-6312
B-98	FRANKS & PETROFUNDS #1 Brown	10488	Hosston	2473-10487
B-99	ARK-LA EXP. & FRANKS #1 Page	9220	Hosston	1843-9216
B-102	CARTER #1 Woodard	6870	Hosston	1525-6869
B-103	PAN AMERICAN #1 Smith	5417	Salt	15-5395
B-107	AMERADA #1 Connell	10006	Hosston	58-10006
B-108	TESORO #1 Lawhon	7201	Sligo	998-7200
B-122A	RUSHING #1 Walker	7456	Hosston	2105-7455
B-123	CARTER #1 Bates	5722	Rodessa	1985-5722
B-124	HOPE #1 Woodard-Walker	5777	Rodessa	2056-4400
B-125	CARTER #2 Stark	10192	Cotton Valley	119-10185
B-153	FRANKS & PETROFUNDS #1 Ryan	5910	Pine Island	525-5909
B-158	GARFIELD & PASTERNAK #1 Woodard-Walker	5415	Pine Island	532-5415
B-159	NORTON #1 Reeve	7103	Hosston	661-7103
B-160	BARNWELL #1 Woodard-Walker	7042	Sligo	833-7038
B-161	CARTER #1 Morris	11114	Cotton Valley	117-11105
B-213	LYONS #1 Adams	6905	Sligo	1886-6902
B-259	CARTER-JONES #1 Woodard-Walker	17318	Sligo	701-7318
B-268	HYDE #1 Cole	6830	Sligo	994-6830
B-270	BUTLER ET AL #1 Carter	8520	Hosston	6970-8519

*Location of Wells Shown in Figure A-3.1.

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NORTH LOUISIANA STUDY AREA

APPENDIX A-3

TABLE A-3.1 (Page 2 of 7)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF VACHERIE DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
B-271	CARTER #2 Woodard	8014	Hosston	1463-8011
B-274	CARTER #1 Walker	5704	Rodessa	2028-5704
B-275	FRANKS & PETROFUNDS #V-1 Cont. Can	8720	Hosston	1858-8697
B-306	TIDEWAY ONSHORE #1 CCC	11354	Cotton Valley	4966-11348
B-392	CARTER OIL CO. #1 Daisy Woodward	6850	Sligo	100-6848
B-457	HAMLIN & NOLTE #2 Dresser Minerals	265	Cane River	20-264
B-458	L.D.P.W. Central Test Well #1	581	Wilcox	22-554
B-467	CARTER #2 Ann Walker	7587	Hosston	126-7587
LVH-6A*	D.O.E. CONT. FOREST IND.	3000	Austin	87-3002
LVH-6B*	D.O.E. CONT. FOREST IND.	1935	Nacatoch	37-1933
LVH-6C*	D.O.E. CONT. FOREST IND.	985	Wilcox	88-910
LVH-6WS*	D.O.E. CONT. FOREST IND.	144	Cane River	8-142
WB-2	CARTER #1 Mott	7106	Hosston	1545-7106
WB-2A	RUSHING #1 Woodard-Walker	5673	Rodessa	576-5673
WB-3	CARTER #1 Colbert-Davis	5469	Rodessa	506-5469
WB-4	TEMPLE #1 Woodard-Walker	1872	Nacatoch	168-1870
WB-5	STEWART #1 Woodard-Walker	3626	Tuscaloosa	103-3626
WB-6	PAN AMERICAN #1 Rowland	8962	Hosston	1436-8956
WB-7	CARTER #2 Walker	7302	Hosston	1489-7302
WB-8	CARTER #1 Johnson	7840	Rodessa	523-5835
WB-9	GREAT WESTERN #1 Moore	7411	Hosston	2034-7410

*Area Characterization Well

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NORTH LOUISIANA STUDY AREA

APPENDIX A-3

TABLE A-3.1 (Page 3 of 7)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF VACHERIE DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
WB-10	MONTGOMERY #1 Woodard-Walker	4289	Salt	530-4289
WB-11	COULSTON #1 Walker	5828	Rodessa	524-5827
WB-12	LSU #V-4	752	Midway	80-746
WB-13	SHULER #1 Scott	5367	Pine Island	409-5366
WB-16	SHULER #1 Moore	5320	Salt	623-5183
WB-17	MOFFITT & PERRITT #2 Fudicker	5729	Rodessa	717-5728
WB-20	HALSTEAD #1 Collingsworth	6553	Sligo	821-6552
WB-21	TRIDENT #1 Ward	6705	Sligo	803-6683
WB-24	PHILLIPS #3 Davis	9026	Hosston	1886-9020
WB-31	PHILLIPS #2 Davis	9024	Hosston	1804-9018
WB-32	PHILLIPS AM-1 Walker	9026	Hosston	1845-9020
WB-33	UNION #1 Walker	10382	Hosston	50-10382
WB-34	CROW #A-1 Davis	7600	Hosston	528-7314
WB-35	CARTER #3 Davis	14146	Bossier	440-14146
WB-92A	CROW & FORD #1 Jordan	946	Vacherie Caprock	50-946
WB-142	FEAZEL #1 Tillman	6070	Rodessa	1948-6070
WB-143	CARTER #1 Johnson	7840	Hosston	70-7840
WB-150	ATLANTIC #1 Butler	7028	Hosston	132-7028
WB-151	ATLANTIC #1 Nicholson	7101	Hosston	998-7101
WB-152	SKLAR #1 Batton	6812	Sligo	1024-6812
WB-153	SKLAR #1 Kennon	6605	Sligo	803-6598
WB-154	ATLANTIC #2 Connell	6931	Hosston	905-6931
WB-156	CROW #B-1 Cook	7062	Hosston	806-7061
WB-169	L.D.P.W. # Bistineau	503	Wilcox	130-501
WB-170	L.D.P.W. #2 Bistineau	567	Wilcox	20-566
WB-171	L.D.P.W. #2 Bistineau Wb-333	463	Wilcox	20-462
WB-177	L.D.P.W. Dubberly Water System #1	514	Wilcox	20-513

*Wells with X-prefix are those for which LETCo has no logs.

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NORTH LOUISIANA STUDY AREA

APPENDIX A-3

TABLE A-3.1 (Page 4 of 7)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF VACHERIE DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
WB-198	L.D.P.W. #3 Bistineau	504	Wilcox	30-503
WB-199	L.D.P.W. #1 Heflin	603	Wilcox	45-597
WB-200	L.D.P.W. Salt Works Com. #2	500	Wilcox	20-498
WB-201	Kin Ark Oil Co. #1 M. Braswell	2277	Ozan	168-2277
X-1*	ATLANTIC #1 Shadows	5866	--	--
X-2	ATLANTIC #2 Shadows	6726	--	--
X-3	CRYER & NELSON #1 Coussons	8984	--	--
X-4	CROW #1 Woodard	4470	--	--
X-5	CROW #1 Tillman	5855	--	--
X-6	CROW #2 Tillman	5534	Rodessa	2271-5314
X-7	CARTER #1 Tillman	7850	--	--
X-8	RUSHING Cook	5955	--	--
X-9	RUSHING Shelly	7755	Hosston	2270-6848
X-10	RUSHING Harvey	5705	--	--
X-11	RUSHING Batton	7770	--	--
X-12	CARTER #1 Davis	6841	--	--
X-13	CROW #1 Davis	6646	Sligo	975-6338
X-14	CARTER #1 Davis	4445	--	--
X-15	CARTER #2 Davis	4433	--	--
X-16	PHILLIPS #1-B Monzingo	--	--	--
X-17	CARTER #3 Davis	4465	--	--
X-18	CARTER #1 Kean	--	--	--
X-19	CROW-CRYER-MARION #1	4435	--	--
X-20	CROW #1 N. Davis	6629	--	--
X-21	CARTER #1 Monzingo	--	--	--
X-22	HOPE #2 Bates	5698	--	--
X-23	PHILLIPS #1 Davis	10042	--	--
X-24	CARTER #1 Gleason	4448	Tuscaloosa	970-3500

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APPENDIX A-3

TABLE A-3.1 (Page 5 of 7)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF VACHERIE DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
X-25	ALICE-SIDNEY #1 Woodard-Walker	--	--	--
X-26	CARTER #2 Walker	8005	Hosston	1787-6975
X-27	CARTER #2 Woodard	7588	Hosston	202-6830
X-28	CARTER #1 Walker	7660	--	--
X-29	CARTER #1 Colbert	6613	--	--
X-30	CARTER #2 Rife	8014	--	--
X-31	CARTER #1 Styles	4450	--	--
X-32	HOPE #1 Walker	5135	--	--
X-33	CARTER #1 Davis	5580	--	--
X-34	CARTER #4 Davis	5320	--	--
X-35	RUSHING-HOPE #1 Butler	5752	Rodessa	2246-5265
X-36	CARTER #1 Bates	4463	--	--
X-37	CARTER #2 Bates	--	--	--
X-38	CARTER #1 J.D.Bates	4465	Mooringsport	941-4220
X-39	CARTER #1 Fuller	4460	--	--
X-40	CARTER #2 Fuller	4448	--	--
X-41	NELSON #1-A Lewis	6740	--	--
X-42	FRANKS #1-A Bates	--	--	--
X-43	CARTER #1 Feldman	5323	--	--
X-44	CARTER #1 Lewis	9450	--	--
X-45	CARTER #1 Davis	7600	--	--
X-46	NELSON #1 Butler	--	--	--
X-47	NELSON #1 Bailey	9100	--	--
X-48	EVANS #1	2680	--	--
X-49	ATLANTIC #1 Batton	5901	--	--
X-50	FRANKS & PETROFUNDS #1-A Crichton	8812	Hosston	1653-6882
X-51	UNION #1 Johnson	5781	--	--
X-52	ATLANTIC #1 Johnson	5927	--	--

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APPENDIX A-3

TABLE A-3.1 (Page 6 of 7)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF VACHERIE DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
X-53	UNION #1-Ambrose	--	--	--
X-54	UNION #1 Evans	5589	--	--
X-55	FRANKS #2 Wilson	--	--	--
X-56	SKLAR #1 Moffit	6810	--	--
X-57	WILSON #1 Roberts	5736	--	--
X-58	WILSON #A-1 Crichton	5744	--	--
X-59	PLACID #1 Starts	5721	--	--
X-60	FRANKS & PETROFUNDS #1 Methodist	8936	--	--
X-61	FRANKS & PETROFUNDS #2 Methodist	4788	--	--
X-62	STANDARD #1 Fudicker	7205	Hosston	2992-6852
X-63	NELSON #1-A Davis	6793	--	--
X-64	NELSON #1-A Woodard-Walker	6922	--	--
X-65	HOPE #1 Davis	5668	--	--
X-66	NELSON #1 Davis	6731	--	--
X-67	CARTER #1 Bates Burson	5407	Rodessa	648-4959
X-68	CARTER #1 Woodard Walker	5425	Rodessa	999-5240
X-69	CARTER #1 Stark	5784	Rodessa	2282-5260
X-70	CARTER #1 H.Walker	5404	Rodessa	1106-5250
X-71	CARTER #1 Woodard	5698	--	--
X-72	CARTER-HOPE #1 Woodard-Walker	5453	--	--
X-73	CARTER #1 A. Walker	--	--	--
X-74	PHILLIPS #1-B Burson	--	--	--
X-75	FRANKS #1 Burson	--	--	--
X-76	HUMBLE #1 Walker	5702	--	--
X-77	HUMBLE #2 Carter	5755	--	--
X-78	FRANKS #1 Carter	--	--	--

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NORTH LOUISIANA STUDY AREA

APPENDIX A-3

TABLE A-3.1 (Page 7 of 7)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF VACHERIE DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
X-79	CARTER #1 Walker	7400	--	--
X-80	NELSON #1-B Woodard-Walker	7160	--	--
X-81	NELSON #1 Woodard	7080	--	--
X-82	NELSON #1 Rowland	--	--	--
X-83	FRANKS & PETROFUNDS #1 Tillman	9000	Hosston	2226-7180
X-84	WADLEY #1 Pierce	3350	--	--
X-85	STANDARD #1 Scott	2588	--	--
X-86	MIDWAY #1	1485	--	--
X-87	LANE #1 Miles	1409	--	--
X-88	FRANKS & PETROFUNDS #1 Jones	5935	--	--
X-89	GARLAND #1 Frye	--	--	--
X-90	COLLINS #1 Madden	--	--	--
X-91	LOWERY #1 Madden	--	--	--

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NORTH LOUISIANA STUDY AREA

APPENDIX A-3

TABLE A-3.2 (Page 1 of 4)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF RAYBURNS DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
B-1	FRANKS & PETROFUNDS #G-1 Cont. Can	8729	Hosston	1447-8728
B-4	BUDDECKE #1 Barron	9072	Hosston	1436-9070
B-5	FRANKS & PETROFUNDS #1 Frey	9320	Hosston	1403-9319
B-6	FRANKS & PETROFUNDS #B-1 Willamette	9014	Hosston	1449-9013
B-7	FRANKS & PETROFUNDS #N-1 Cont. Can	9066	Hosston	1435-9065
B-9	FRANKS & PETROFUNDS #1 Davies	8898	Hosston	2320-8897
B-10	FRANKS & PETROFUNDS #B-1 Johnson	8900	Hosston	1589-8896
B-11	FRANKS PETROFUNDS #R-1 Cont. Can	8894	Hosston	1500-8891
B-12	FRANKS & PETROFUNDS #1 Blackwood	8916	Hosston	1497-8915
B-13	FRANKS, PETROFUNDS & BODCAW #B-1 Hoss	8918	Hosston	1818-8917
B-14	FRANKS & PETROFUNDS #A-1 Walton	8842	Hosston	1479-8841
B-15	FRANKS & PETROFUNDS #T-1 Cont. Can	8897	Hosston	2293-8896
B-23	UNION #1 Frazier	8523	Hosston	222-8522
B-25	UNION #1 Babers	6800	James	45-6800
B-30	SMITH & CAMERON #1 Smitherman	8618	Hosston	1402-7213
B-32	UNION #1 Allison	7964	Hosston	97-7964
B-33	PLACID #A-3 So. Adv.	8604	Hosston	1662-8604
B-34	PLACID #A-2 So. Adv.	8547	Hosston	1615-8547
B-35	PLACID #A-1 So. Adv.	8880	Hosston	1479-8880
B-36	PLACID #B-1 So. Adv.	8551	Hosston	1546-8551
B-37	CARAWAY #1 Cont. Can	8880	Hosston	1407-8871
B-38	HODGE-HUNT #A-1 Cont. Can	4310	Paluxy	400-4305

*Location of wells shown in Figure A-3.2.

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NORTH LOUISIANA STUDY AREA

APPENDIX A-3

TABLE A-3.2 (Page 2 of 4)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF RAYBURNS DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
B-39	BROYLES #A-1 Cont. Can	9056	Hosston	1404-9050
B-41	HODGE-HUNT #1 Cont. Can	4120	Tuscaloosa	161-4110
B-45	ROBERTS #1 Cont. Can	8530	Hosston	1395-8510
B-57	PLACID #1 Whitley	8102	Hosston	1445-8102
B-58	PLACID #1 Unit #2 Wideman	8325	Hosston	1515-8323
B-59	PLACID #1 Harrison	8529	Hosston	1547-8529
B-60	BRIGHT & SCHIFF #1 Kemp	8771	Hosston	1040-8768
B-61	CROW & EVANS Lymberis #1	8499	Hosston	1420-8498
B-62	PLACID #2 So. Advance, H. Hunt	8381	Hosston	1421-8381
B-63	PLACID #1 Hodge-Hunt	8113	Hosston	1750-8111
B-67	HODGE-HUNT #2 Cont. Can	4048	Tuscaloosa	150-4042
B-69	HODGE-HUNT #7 Cont. Can	4237	Rusk	159-4230
B-200	MONSANTO #1 Hunt	8606	Hosston	1498-8600
B-202	PLACID #2 Whitley	9797	Hosston	2104-9795
B-235	BODCAW #2 Fee	8824	Hosston	2198-8818
B-237	BODCAW #5 Fee LBN	9893	Hosston	2160-9730
B-407	L.D.P.W. Danville Test #1	554	Cane River	80-553
B-408	U.S.G.S. Friendship #1	1019	Wilcox	20-1015
B-411	L.D.P.W. Southeast Bienville Test #2	286	Cane River	20-285
B-429	TRIANGLE PUMP CO. #8 Continental Can	491	Cane River	
B-430	TRIANGLE PUMP CO. #17 Continental Can	496	Cane River	80-496
B-431	TRIANGLE PUMP CO.	537	Cane River	80-537
B-432	L.D.P.W. Friendship Com. Test #1	285	Cane River	20-284

*Area Characterization Well
**Wells with Y-prefix are those for which LETCo has no logs.

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NORTH LOUISIANA STUDY AREA

APPENDIX A-3

TABLE A-3.2 (Page 3 of 4)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF RAYBURNS DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
B-433	L.D.P.W. Lucky #1	650	Wilcox	20-641
B-434	LANFORD DRILLING COMPANY LSU Test Well #R-2B	1207	Midway	42-1201
B-435	LANFORD DRILLING COMPANY LSU #R-3B	1111	Midway	67-1103
LRH-13A*	D.O.E. CONT. FOREST IND.	1485	Midway	70-1488
LRH-13B*	D.O.E. CONT. FOREST IND.	667	Wilcox	70-561
LRH-13WS*	D.O.E. CONT. FOREST IND.	365	Cane River	25-364
Y-1**	PLACID #1 Hunt	--	--	--
Y-2	PLACID #1 Sou. Adv.	8643	--	--
Y-3	SMITHERMAN #1 Hunt	3000	--	--
Y-4	PLACID #1 Cont. Can	9800	--	--
Y-5	PLACID #2 Whitney	9800	--	--
Y-6	PLACID #3 Watson et al	6650	--	--
Y-7	PLACID #2 Cont. Can	3760	--	--
Y-8	HODGE-HUNT #2 Fee	3003	--	--
Y-9	U.S.G.S. #1 Friendship	--	--	--
Y-10	BODCAW #1 Burns	8390	--	--
Y-11	PETROFUNDS #1 Pardee	8708	Hosston	--
Y-12	LOE #1 G. La. Pacific	3920	--	--
Y-13	TEXACO #1 Pullin	11300	--	--
Y-14	BODCAW & PETROFUNDS #1 Frey	9805	--	--
Y-15	PETROFUNDS #1 Hoss	9800	--	--
Y-16	TEXACO #1 Johnson	7531	Sligo	1573-7479
Y-17	BODCAW ET AL #2 Cont. Can	9800	Hosston	2243-8115
Y-18	BODCAW ET AL #1 Cont. Can	10700	--	--

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NORTH LOUISIANA STUDY AREA

APPENDIX A-3

TABLE A-3.2 (Page 4 of 4)

HYDROCARBON AND MINERAL EXPLORATION WELLS WITHIN A 5-MILE RADIUS OF RAYBURNS DOME*

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/ Group at Termination	Logged Interval (ft.)
Y-19	BODCAW & PETROFUNDS #1 Harper	9800	--	--
Y-20	BODCAW, FRANKS & TEXACO #1 Harper	12631	Bossier	2055-11133
Y-21	BODCAW #2 Bodcaw	--	--	--
Y-22	BODCAW ET AL #1 Payton	--	--	--

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93°17' R9W R8W 93°12' R8W R7W 93°7'

32°30' T18N T17N

32°25' T17N T16N

5-MILE RADIUS FROM DOME CENTER

-3000-

LVH-6

N

LEGEND:

- OIL OR GAS WELL
- AREA CHARACTERIZATION HYDROLOGIC BORING
- L.S.U. HYDROLOGIC BORING
- -3000- INTERPRETED SALT CONTOUR ELEVATION, FEET MSL

NOTE:

WELLS WITHIN THE -3000' FOOT MSL SALT CONTOUR ARE SHOWN ON FIGURE 10-7 VOLUME III

STUDY AREA

VACHERIE DOME

1 0 1 MILE

1 0 1 KILOMETERS

NORTH LOUISIANA STUDY AREA
APPENDIX A-3
LOCATION MAP OF WELLS WITHIN 5 MILE RADIUS OF VACHERIE DOME

JOB NO. MV9700 FIGURE A-3.1

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES

LAW ENGINEERING TESTING COMPANY MARIETTA, GEORGIA

PREPARED DATE 2/13/81
REVISED DATE
REVISED DATE 2/13/81
APPROVED DATE 2/13/81

T-1709-0

FIGURE A-3.1

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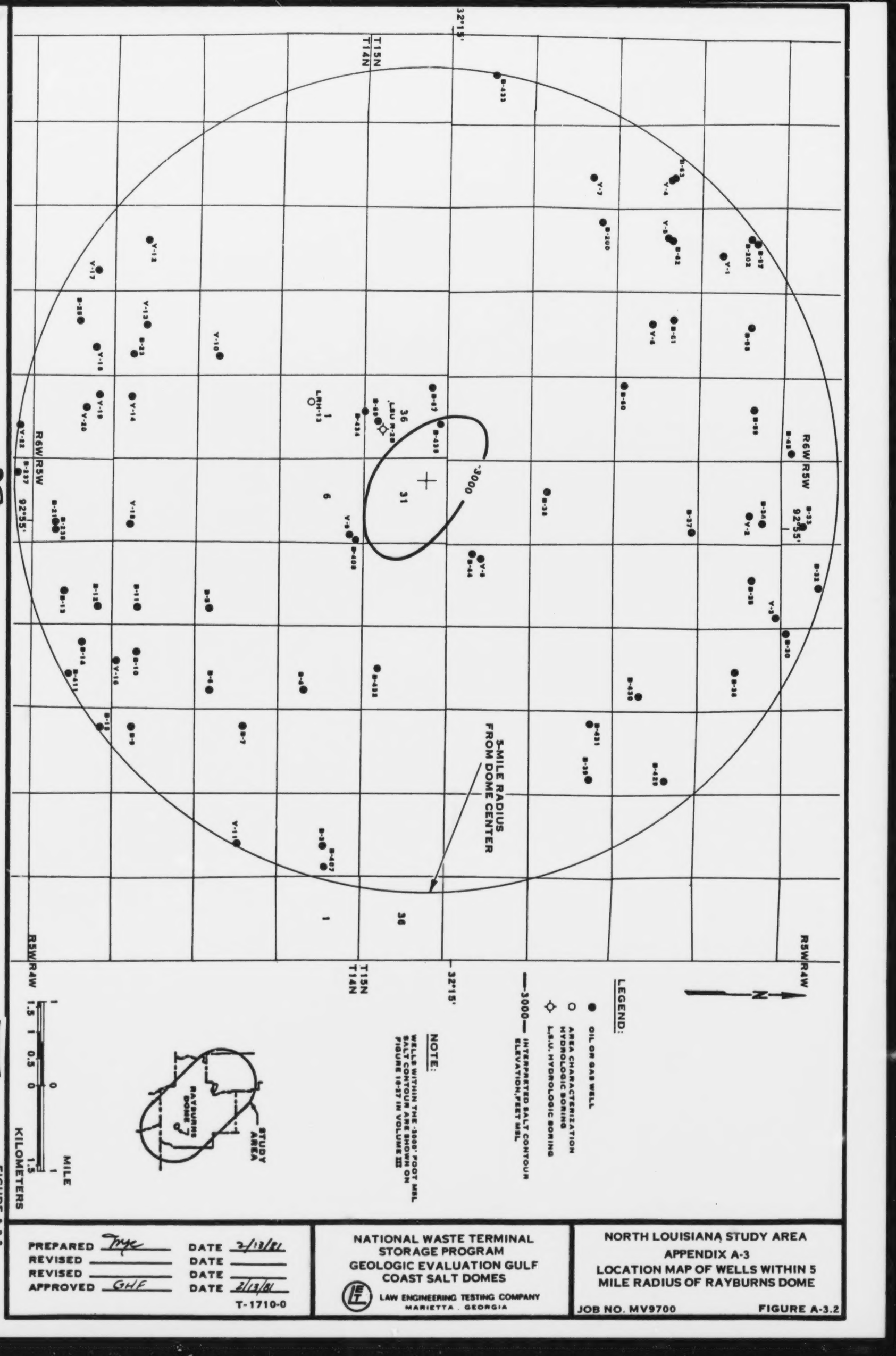
R6W/R5W
92°55'
32°15'
T15N
T14N
R5W/R4W
R6W/R5W
92°55'
32°15'
T15N
T14N
R5W/R4W
-3000-
5-MILE RADIUS FROM DOME CENTER
36
31
6
1
LRH-13
LBU R-28
B-102
B-202
B-433
B-431
B-435
B-434
B-438
B-437
B-408
B-227
Y-22
Y-17
Y-18
Y-19
Y-20
Y-12
Y-13
Y-14
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B-38
B-39
B-40

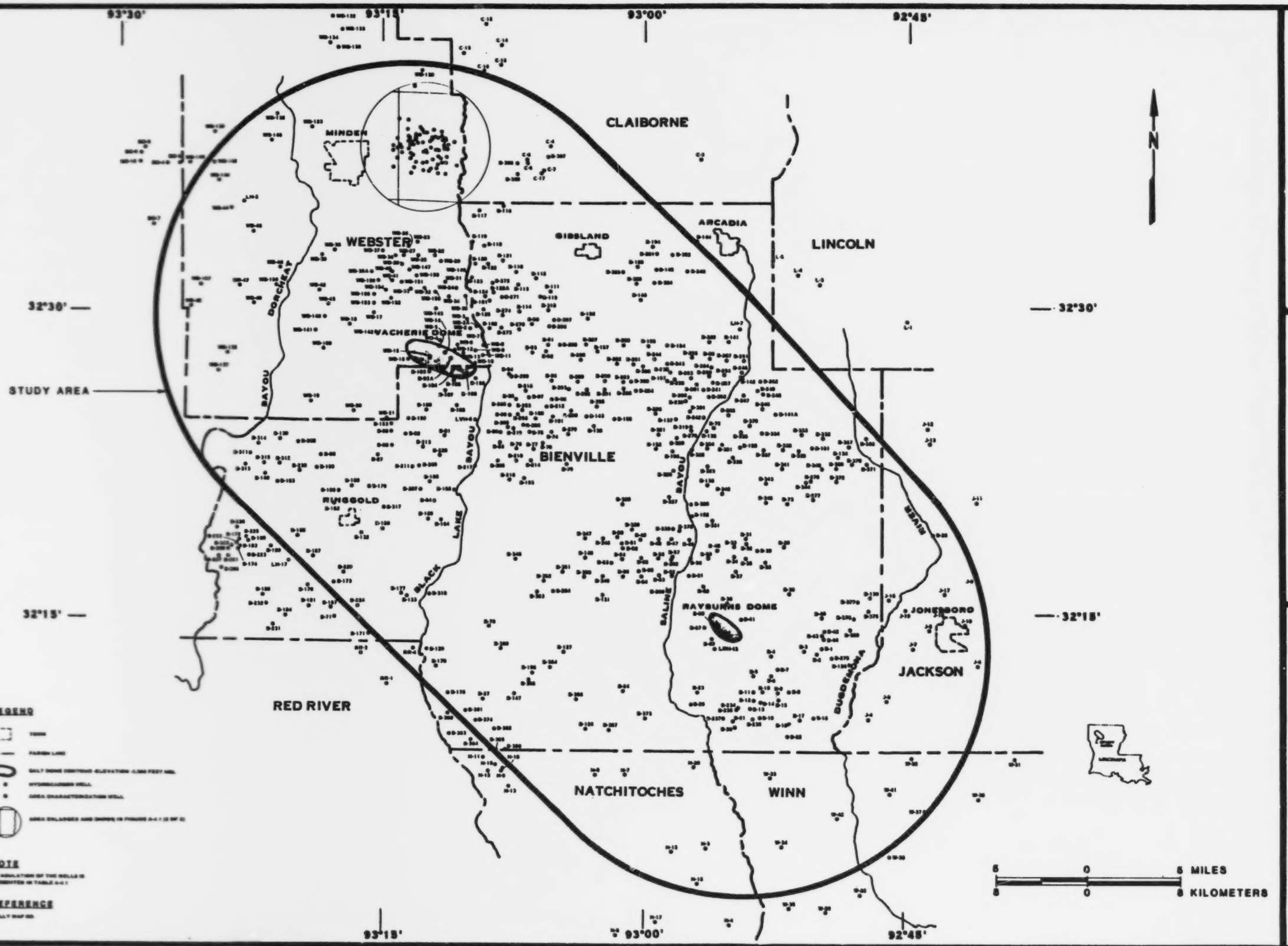
NORTH LOUISIANA STUDY AREA

APPENDIX A-4

STUDY AREA WELL DATA

Well data from previously drilled wells and Area Characterization wells were used to determine the tops of the geologic units within the study area. These data were used to construct structural contour and isopach maps for structural and stratigraphic analyses of the study area. The locations of the wells used in the study are shown in Figure A-4.1. A tabulation of the hydrocarbon wells (dry and productive) and Area Characterization wells which were utilized in these studies is presented in Table A-4.1.

Geophysical log data and Louisiana Department of Conservation records were used to determine the well locations. Information concerning the total depth of the wells, stratigraphic horizons at termination, and logged intervals was obtained from geophysical logs, scout cards, and Department of Conservation completion reports.



NORTH LOUISIANA STUDY AREA
APPENDIX A-4
LOCATION MAP OF WELLS USED IN ANALYSES

JOB NO. MV9700 FIGURE A-4.1 (1 OF 2)

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES

LAW ENGINEERING TESTING COMPANY MARIETTA, GEORGIA

T-1711-0

PREPARED DATE 2/13/81
REVISED DATE
REVISED DATE
APPROVED DATE 2/13/81

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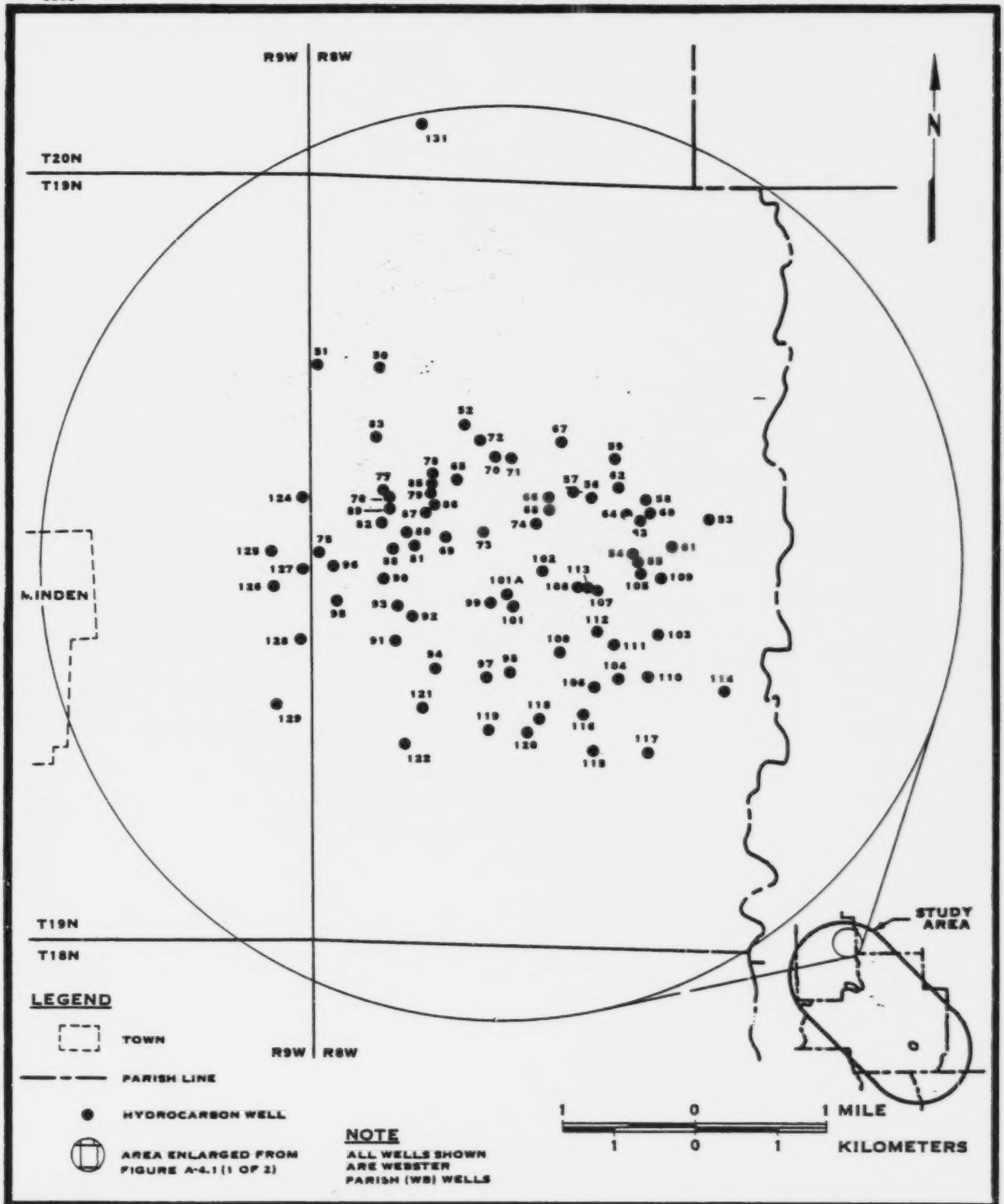

PREPARED [signature] DATE 2/18/82 REVISED ____ DATE ____ REVISED ____ DATE ____ APPROVED GHF DATE 2/19/82 T-1711-0	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA	NORTH LOUISIANA STUDY AREA APPENDIX A-4 LOCATION MAP OF WELLS USED IN ANALYSES FIGURE A-4.1 (2 OF 2) JOB NO. MV9700

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 1 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-1	E-K OIL #1 Tardo	8719	Hosston	1425-8718
B-2	SOHIO #1 Caston	10100	Hosston	1932-10098
B-3	FRANKS & PETROFUNDS #G-1 Cont. Can	8729	Hosston	1447-8728
B-4	BUDDECKE #1 Barron	9072	Hosston	1436-9070
B-5	FRANKS & PETROFUNDS #1 Frey	9320	Hosston	1403-9319
B-6	FRANKS & PETROFUNDS #B-1 Williamette	9014	Hosston	1449-9013
B-7	FRANKS & PETROFUNDS #N-1 Cont. Can	9066	Hosston	1435-9065
B-8	FRANKS & PETROFUNDS #1 Blankenship	9001	Hosston	2201-9000
B-9	FRANKS & PETROFUNDS #1 Davies	8898	Hosston	2320-8897
B-10	FRANKS & PETROFUNDS #B-1 Johnson	8900	Hosston	1589-8896
B-11	FRANKS PETROFUNDS #R-1 Cont. Can	8894	Hosston	1500-8891
B-12	FRANKS & PETROFUNDS #1 Blackwood	8916	Hosston	1497-8915
B-13	FRANKS, PETROFUNDS & BODCAW #B-1 Hoss	8918	Hosston	1818-8917
B-14	FRANKS & PETROFUNDS #A-1 Walton	8842	Hosston	1479-8841
B-15	FRANKS & PETROFUNDS #T-1 Cont. Can	8897	Hosston	2293-8896
B-16	GEBCO & PHILLIPS #1 Lard	8806	Hosston	1410-8800
B-17	SKLAR & PHILLIPS #1 Brown	8794	Hosston	1455-8788
B-18	FRANKS & PETROFUNDS #S-1 Cont. Can	8899	Hosston	1424-8898
B-19	FRANKS & PETROFUNDS #V-1 Cont. Can	9014	Hosston	2230-8991
B-20	UNION #1 Nebo	10008	Hosston	416-10004

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 2 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-21	HUNT #1 Bodcaw	7784	Hosston	416-7783
B-22	SMACKOVER #1 Cont. Can	8768	Hosston	1424-8744
B-23	UNION #1 Frazier	8523	Hosston	222-8522
B-24	LAGRANGE #1 Fair	5013	Mooringsport	453-5007
B-25	UNION #1 Babers	6800	James	45-6800
B-26	CADDO #1 Woodard-Walker	4025	Tuscaloosa	307-4019
B-27	JAMES #1 Laster	9819	Cotton Valley	2093-9813
B-28	TRAHAN #1 Cont. Can	7877	Hosston	1036-7846
B-29	SCHOELLKOPF #1 Caldwell	9014	Hosston	1499-9008
B-30	SMITH & CAMERON #1 Smitherman	8618	Hosston	1402-7213
B-31	FRANKS #1 Allison	8300	Hosston	1060-8298
B-32	UNION #1 Allison	7964	Hosston	97-7964
B-33	PLACID #A-3 So. Adv.	8604	Hosston	1662-8604
B-34	PLACID #A-2 So. Adv.	8547	Hosston	1615-8547
B-35	PLACID #A-1 So. Adv.	8880	Hosston	1479-8880
B-36	PLACID #B-1 So. Adv.	8551	Hosston	1546-8551
B-37	CARAWAY #1 Cont. Can	8880	Hosston	1407-8871
B-38	HODGE-HUNT #A-1 Cont. Can	4310	Paluxy	400-4305
B-39	BROYLES #A-1 Cont. Can	9056	Hosston	1404-9050
B-40	ARK-LA GAS #1 Cont. Can	9320	Hosston	1845-9316
B-41	HODGE-HUNT #1 Cont. Can	4120	Tuscaloosa	161-4110
B-42	EVANS & COPELAND #1 Flowers	8816	Hosston	1429-8795
B-43	ARK-LA GAS #2 Cont. Can	10220	Hosston	1818-10216

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 3 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-44	SUNNY SOUTH #D-1 Cont. Can	8719	Hosston	1468-8718
B-45	ROBERTS #1 Cont. Can	8530	Hosston	1395-8510
B-46	PLACID #1 Watson	8345	Hosston	1500-8344
B-47	PLACID #1 So. Adv.	8003	Hosston	1404-8003
B-48	PLACID & NEBO #1 Huey	8133	Hosston	1442-8133
B-49	PLACID #A-2 Nebo	8305	Hosston	1186-8305
B-50	PLACID #2 Wood Unit #1	13578	Cotton Valley	2050-13574
B-51	PLACID #1 Woods	8149	Hosston	1921-8146
B-52	PLACID #A-1 Wood	3739	Tuscaloosa	544-3733
B-53	PLACID #A-9 Nebo	3715	Tuscaloosa	509-3709
B-54	PLACID #1 Miller	7462	Hosston	2339-7462
B-55	PENROD #1 Sprawls	7987	Hosston	40-7987
B-56	PLACID #1 Wise	8223	Hosston	1408-8223
B-57	PLACID #1 Whitley	8102	Hosston	1445-8102
B-58	PLACID #1 Unit #2 Wideman	8325	Hosston	1515-8323
B-59	PLACID #1 Harrison	8529	Hosston	1547-8529
B-60	BRIGHT & SCHIFF #1 Kemp	8771	Hosston	1040-8768
B-61	CROW & EVANS Lymberis #1	8499	Hosston	1420-8498
B-62	PLACID #2 So. Advance-H. Hunt	8381	Hosston	1421-8381
B-63	PLACID #1 Hodge-Hunt	8113	Hosston	1750-8111
B-64	PLACID #A-4 Nebo	7599	Hosston	30-7569
B-65	BENEDUM Sprawls	5005	Paluxy	400-4998
B-66	PLACID #A-3 Nebo	10329	Hosston	4385-10320
B-67	HODGE-HUNT #2 Cont. Can	4048	Tusaloosa	150-4042

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 4 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-68	HODGE-HUNT #3 Cont. Can	709	Salt	141-591
B-69	HODGE-HUNT #7 Cont. Can	4237	Rusk	159-4230
B-70	WYSOCKI #1 Chandler	3529	Rusk	325-3529
B-71	MAY #1 Martin	10507	Cotton Valley	2390-10501
B-72	SOUTHERN #2 Cummings	13006	Haynesville	1833-1300
B-73	SUNNY S.-PETROFUNDS #1 Smitherman	9912	Hosston	1850-9896
B-74	FRANKS & PETROFUNDS #1 Olinkraft	9551	Hosston	2509-9550
B-75	FRANKS & PETROFUNDS #1 Cont. Can	8407	Hosston	1432-8406
B-76	FRANKS & PETROFUNDS #1 Cox	9903	Hosston	2002-9902
B-77	FRANKS & PETROFUNDS #1 Woodard-Walker	9511	Hosston	2038-9510
B-78	FRANKS & PETROFUNDS #8-1 Cont. Can	9524	Hosston	2025-9523
B-79	NEBO #1 Colbert	8263	Hosston	1214-8263
B-80	FRANKS & PETROFUNDS #1 Smith	9849	Hosston	2517-9848
B-81	ROBERTS #1 Ratliff	7203	Hosston	724-7197
B-82	MONTGOMERY #1 Davis	7953	Hosston	759-7947
B-83	FRANKS & PETROFUNDS #1 Pullig	10018	Hosston	2462-10016
B-84	HUGGS #1 Kirkham	6621	Sligo	934-6615
B-85	FRANKS & PETROFUNDS & TRIDENT #2 Ryan	5915	James	546-5914
B-86	ARK-LA GAS #1 Thomas	8339	Hosston	1425-8338
B-87	BOND #1 Davis	6807	Hosston	613-6802
B-88	HADSON #1 Frye	6672	Sligo	815-6671
B-89	LION #1 Ozley	10503	Cotton Valley	325-10503

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 5 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-90	FRANKS & EVANS #1 Hines	9337	Hosston	1425-9336
B-91	PHILLIPS #1-P Baker	10005	Hosston	1806-10003
B-92	PHILLIPS #1 Hoss	10027	Hosston	1836-10024
B-93	PHILLIPS #A-1 Lyles	9718	Hosston	1838-9712
B-94	UNION #1 Woodard-Walker	6313	James	1006-6312
B-95	FRANKS & PETROFUNDS #F-1 Woodard-Walker	9758	Hosston	2422-9757
B-96	FRANKS & PETROFUNDS #A-1 Woodard-Walker	100220	Hosston	2533-10219
B-97	FRANKS & PETROFUNDS #A-1 Cole	9992	Hosston	2348-9991
B-98	FRANKS & PETROFUNDS #1 Brown	10488	Hosston	2473-10487
B-99	ARK-LA EXP. & FRANKS #1 Page	9220	Hosston	1834-9216
B-100	KINSEY & KINSEY #C-1 Woodard-Walker	7706	Hosston	1295-7698
B-101	KINSEY & KINSEY #A-1 Woodard-Walker	8302	Hosston	2189-8296
B-102	CARTER #1 Woodard	6870	Hosston	1525-6869
B-103	PAN AMERICAN #1 Smith	5417	Salt	15-5395
B-104	LSU #V-6	5945	Salt	40-588
B-105	LSU #V-5	815	Wilcox	50-804
B-106	LION #1 Woodard	1823	Salt	538-1822
B-107	AMERADA #1 Connell	10006	Hosston	58-10006
B-108	TESORO #1 Lawhon	7201	Sligo	998-7200
B-109	CRYSTAL #1 Jones	7835	Hosston	1583-7834
B-110	FRANKS #1 Ogywn	8715	Hosston	1460-8714
B-111	ARK-LA EXP. #1 Jackson	9021	Hosston	1845-9020
B-112	S. W. NATURAL PROD. #1 Broadwell	8365	Hosston	1264-8359

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 6 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-113	CARTER #1 Meritt	8047	Hosston	1255-6000
B-114	PHILLIPS #1-A Ouzts	9014	Hosston	1832-9006
B-115	S. W. NATURAL PROD. #1 Smith	8513	Hosston	1510-8507
B-116	LOCKWOOD & LUNSFORD #B-2 Woodard-Walker	2869	Austin	167-2868
B-117	KLEIN & CARUTHERS #1 Beck	11961	Cotton Valley	60-11953
B-118	TRAHAN #1 Morris	8200	Hosston	1434-8199
B-119	TRAHAN #1 Kendrick	8256	Hosston	1457-8284
B-120	FRANKS & PETROFUNDS #G-1 Woodard-Walker	8986	Hosston	2380-8987
B-121	MONSANTO #1 Bert	8774	Hosston	1490-8754
B-122	BARNWELL #1 Mason	7877	Hosston	1407-7876
B-122A	RUSHING #1 Walker	7456	Hosston	2105-7455
B-123	CARTER #1 Bates	5722	Rodessa	1985-5722
B-124	HOPE #1 Woodard-Walker	5777	Rodessa	2056-4400
B-125	CARTER #2 Stark	10192	Cotton Valley	119-10185
B-126	JARRED & DUNICAN #1 Cont. Can & Hodge Hunt	9020	Hosston	1420-9014
B-127	PLACID #B-3 Nebo	8245	Hosston	1764-8242
B-128	CUMMINGS #1 Conger	4122	Paluxy	210-4119
B-129	TIPPERARY #A-1 Martin	7208	Sligo	830-7207
B-130	ARK-LA GAS #4 Cont. Can	10183	Hosston	1824-10178
B-131	PLACID #B-2 Nebo	7842	Hosston	3055-7842
B-132	BOWLES #1 Bank of Ringgold	5035	Ferry Lake	345-5034
B-133	ZADECK-DE SOTO & JONES-O'BRIEN #1 Smith	6645	Sligo	831-6644

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 7 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-134	BARNSDALL #1 Davis	11330	Cotton Valley	239-11330
B-135	SOUTHERN #1 Cummings	7443	Hosston	534-7436
B-136	SOUTHERN #1 Hays	8557	Hosston	1600-8557
B-137	SOUTHERN #1 Poland	13139	Bossier	1785-13134
B-138	FRANKS #O-1 Cont. Can	10412	Cotton Valley	2427-10411
B-139	FRANKS #E-1 Woodard-Walker	8103	Hosston	1474-8102
B-140	ARK-LA GAS #2 Gayoso	8532	Cotton Valley	166-8508
B-141	SKELLY #1 Pentacost	11815	Hosston	1876-11814
B-141A	GRIGSBY-BROYLES #1 Bowman	8008	Hosston	1453-7993
B-142	SOUTHERN #1 Davis	8424	Hosston	2315-8424
B-143	FRANKS & PETROFUNDS #M-1 Cont. Can	10152	Hosston	2467-10151
B-144	WHELESS #1 Giddens	9608	Hosston	826-9607
B-145	CRYSTAL #1 Hassell	11021	Hosston	1017-11020
B-146	CRYSTAL #1 Woodard-Walker	7815	Hosston	987-7814
B-147	SKELLY #1 Godfrey	9006	Hosston	98-9006
B-148	PLACID #A-1 Nebo	7804	Hosston	2114-6207
B-149	TIPPERARY #1 Martin	6208	James	827-6207
B-151	FRANKS & PETROFUNDS #1 Holland	8474	Hosston	1475-8456
B-152	BROYLES #B-1 Cont. Can	11680	Cotton Valley	2227-11678
B-153	FRANKS & PETROFUNDS #1 Ryan	5910	Pine Island	525-5909
B-154	FRANKS & PETROFUNDS #D-1 Woodard-Walker	10016	Hosston	2332-9971
B-155	KINSEY-KINSEY #B-1 Woodard-Walker	8432	Hosston	2185-8427

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 8 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-156	S.W. NAT. PROD. #1 English	10015	Cotton Valley	1506-10006
B-157	HYDE #1 Cole	6830	Sligo	994-6830
B-158	GARFIELD & PASTERNAK #1 Woodard-Walker	5415	Pine Island	532-5415
B-159	NORTON #1 Reeve	7103	Hosston	661-7103
B-160	BARNWELL #1 Woodard-Walker	7042	Sligo	833-7038
B-161	CARTER #1 Morris	11114	Cotton Valley	117-11105
B-162	BARNWELL #1 Barnwell-Bistineau	6311	Sligo	875-6310
B-163	ARK-LA GAS #C-1 Thomas	5366	Sligo	165-5366
B-164	HUGGS & SPAN AMERICAN #1 Adams	6704	Sligo	960-6698
B-165	SPAN AMERICAN #1 Whatley	6457	Sligo	957-6454
B-166	ARK-LA EXP. #1 Lawhon	6002	Pine Island	530-5998
B-167	CUMMINS & LOHMON #1 Long Bell	3161	Tuscaloosa	100-3161
B-168	KENDRICK #1 Mosely	3010	Tuscaloosa	120-3010
B-169	MCDOWELL & GAMMILL #1 International	3003	Tuscaloosa	168-3002
B-170	HUNT #1 Lacy	3544	Rusk	416-3544
B-171	HARGRAVES #1 Woodard	3229	Tuscaloosa	325-3223
B-172	ALLEN #2 McCoy	2880	Tuscaloosa	195-2879
B-173	TESORO & BINTLIFF #1 Robbins	10387	Cotton Valley	2462-10381
B-174	CROW #A-1 Waits	2838	Tuscaloosa	162-2838
B-176	IRONS #1 Byrd	3473	Tuscaloosa	400-3467
B-177	HARGRAVES #1 Boyett	3405	Rusk	248-3399
B-178	JOHNSON #1 McKnight	3257	Tuscaloosa	131-3257

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-179	CROW #1 Pietsch	6504	Sligo	997-6504
B-180	CONTINENTAL #1 Scott	6116	Sligo	985-6116
B-181	SAWYER #1 Golson	5508	Rodessa	531-5507
B-182	HUNT #1 Chandler	6809	Sligo	857-6805
B-183	ALLEN #3-12 McCoy	2847	Tuscaloosa	154-2846
B-184	GULF ENERGY #1 Conly	10492	Cotton Valley	2559-10486
B-185	BOND #1 Harvey	3065	Tuscaloosa	452-3064
B-186	ATLANTIC #1 Cook	6490	Hosston	103-6490
B-187	MARJA #1 Evans	3116	Tuscaloosa	171-3115
B-188	BARNWELL & ARK-LA GAS #1 Cook	5657	Sligo	773-5656
B-189	CENTRAL #1 Long Bell	2875	Tuscaloosa	125-2875
B-192	LYONS #1 Butler	7975	Hosston	1026-7974
B-193	FRANKS & PETROFUNDS #1 Hamner	9706	Hosston	2432-9705
B-194	ARK-LA GAS #1 Harper	8026	Hosston	1436-8025
B-195	PETROFUNDS & SUNNY SOUTH #1 Woodard-Walker	9471	Hosston	2272-9467
B-196	SO. NAT. GAS #3 Fed. Land Bank	12485	Cotton Valley	1776-12480
B-197	PHILLIPS #1-L Taylor	9421	Hosston	2202-9420
B-198	UNION #1 Pardee	6006	Pine Island	827-6002
B-199	BARNWELL #1 Bachelor	6063	Hosston	840-6062
B-200	MONSANTO #1 Hunt	8606	Hosston	1498-8600
B-201	MCCORMICK #1 Hamner	12834	Cotton Valley	0-12828
B-202	PLACID #2 Whitley	9797	Hosston	2104-9795
B-203	ARK-LA GAS #1 David	8816	Cotton Valley	1350-8815
B-204	WATSON #1 Nix	9504	Hosston	1855-9498

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-205	FRANKS & PETROFUNDS #1 Cathcart	9644	Hosston	2503-9642
B-206	FRANKS & PETROFUNDS #2 Cont. Can	10008	Cotton Valley	2517-10007
B-207	HUNT #1 Marcus	6816	Hosston	846-6812
B-208	FRANKS & PETROFUNDS #1 James	9925	Cotton Valley	3823-9924
B-209	HUNT #1 Lawhon	6787	Sligo	855-6786
B-210	FRANKS & PETROFUNDS #1 Pierce	9728	Hosston	2488-9727
B-211	HUGGS & SCHURMAN #1 Mower	5908	James	980-5902
B-212	FRANKS & PETROFUNDS #H-1 Woodard-Walker	947	Cotton Valley	2350-9470
B-213	LYONS #1 Adams	6905	Sligo	1886-6902
B-214	FRANKS & PETROFUNDS #C-1 Woodard-Walker	9524	Cotton Valley	2415-9523
B-216	FRANKS & PETROFUNDS #1 Evans	9790	Hosston	2490-9789
B-217	TEXAS EASTERN #1 Colbert	7704	Hosston	1187-7704
B-218	WHELESS #1 Cole	8244	Hosston	1432-8239
B-219	OHIO #1 Brinkley	6871	Sligo	30-6871
B-220	NORMAN #1 Miller	3610	Paluxy	235-3609
B-221	GEDNETZ #1 Burkett	3002	Paluxy	158-2997
B-222	GEDNETZ #1 Waites	2922	Paluxy	159-2916
B-223	WADLEY #1 Woodard-Walker	3017	Tuscaloosa	200-3006
B-224	WADLEY #1 Woodard	6413	Sligo	625-6413
B-225	WADLEY #1 Kendrick	3205	Paluxy	150-3199
B-226	WADLEY #1 Jean	2852	Tuscaloosa	110-2852
B-227	O'FERRELL #B-1 Green	2909	Tuscaloosa	117-2909
B-228	O'FERRELL #2 Gilbert	3341	Paluxy	106-3341

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-229	OWENS #1 Moseley	3247	Paluxy	100-3247
B-230	MUNOCO #1 Cagle	5840	Hosston	518-5840
B-231	NEWTON #1 Long Bell	2974	Tuscaloosa	195-2974
B-232	PRODUCERS #1 Graves & Thomas	2930	Austin	86-2200
B-233	CROW #1 Waits	3002	Paluxy	110-3002
B-234	BODCAW #3 Fee LBN	11203	Cotton Valley	504-11197
B-235	BODCAW #2 Fee	8824	Hosston	2198-8818
B-236	BODCAW #7 Fee LBN	8815	Hosston	2156-8800
B-237	BODCAW #5 Fee LBN	9893	Hosston	2160-9730
B-238	PHILLIPS #2-L Taylor	9416	Hosston	2326-9415
B-239	MONSANTO #1 Whitley	9425	Hosston	2353-9421
B-240	BRAMMER #1 Stewart	9518	Hosston	2224-9517
B-241	MONSANTO #1 Cont. Can	9518	Hosston	2349-9514
B-242	SOUTHERN #1 Jones	11013	Cotton Valley	1796-11008
B-243	FRANKS & PETROFUNDS #0-1 Cont. Can	9455	Hosston	2458-9454
B-244	HUMBLE #1 Jones	9505	Hosston	1801-9504
B-245	SOUTHERN #1 Driskill	8356	Hosston	1519-8355
B-246	SOUTHERN #1 Davis Unit 2	8251	Hosston	1805-8250
B-247	SOUTHERN #2 Jordan	8296	Hosston	2244-8296
B-248	SOUTHERN #1 Cathey	8424	Hosston	1608-8424
B-249	SOUTHERN #1 Stinson	8305	Hosston	1620-8304
B-250	SOUTHERN #1 Rogers	7991	Hosston	2265-7991
B-251	MURPHY #1 Barringer	8405	Hosston	2457-8405
B-252	MURPHY #1 Hunt	8204	Hosston	2362-8204
B-253	OHIO #1 Crow	7691	Hosston	38-7691

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-254	MURPHY #1 Pipes	8324	Hosston	880-8324
B-255	LION #1 Colbert	8496	Hosston	304-8496
B-256	ONIO #1 Woodard-Walker	7011	Sligo	200-7011
B-257	CROW #1 Ozley	8012	Hosston	1416-8011
B-258	BROYLES & HOLLOWAY #1 Taylor	8021	Hosston	984-8020
B-259	CARTER-JONES #1 Woodard-Walker	17318	Sligo	701-7318
B-260	CROW & EVANS #1 Whitley	8216	Hosston	1757-8210
B-261	HODGE-HUNT #4 Cont. Can	3806	Austin	150-3800
B-262	BROYLES #1 Murphy	8150	Hosston	1043-8142
B-263	BROYLES #1 Cont. Can	9350	Hosston	6700-9342
B-264	CROW ET AL #1 Vernon	8010	Hosston	1424-7998
B-265	CROW #1 Culbertson	7801	Hosston	1557-7782
B-266	COOK #1 Burkett	3015	Paluxy	108-3015
B-267	LION #1 Lamar	8000	Hosston	1515-8000
B-268	HYDE #1 Cole	6830	Sligo	994-6830
B-269	LION #1 Mabel	8012	Hosston	336-8012
B-270	BUTLER ET AL #1 Carter	8520	Hosston	6970-8519
B-271	CARTER #2 Woodard	8014	Hosston	1463-8011
B-272	PHILLIPS #C-3 Woodard	9820	Hosston	1829-9814
B-273	CARTER #1 Walker	5740	Rodessa	2008-5740
B-274	CARTER #1 Walker	5704	Rodessa	2028-5704
B-275	FRANKS & PETROFUNDS #V-1 Cont. Can	8720	Hosston	1858-8697
B-276	FRANKS & PETROFUNDS #C-1 Cont. Can	9620	Hosston	1846-9616
B-277	FRANKS & PETROFUNDS #G-1 Davis Bros.	10100	Hosston	1863-10100
B-278	SOUTHERN #2 Harrison	11220	Cotton Valley	1854-11212

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-279	FRANKS & PETROFUNDS #E-2 Cont. Can	9404	Hosston	2420-9403
B-280	PHILLIPS #C-1 Merritt	9416	Hosston	2270-9412
B-281	PAN AMERICAN & CROW #1 So. Advance	8005	Hosston	1437-8004
B-282	FRANKS & PETROFUNDS #1 Johnson	9022	Hosston	2248-9021
B-283	PHILLIPS #A-2 Can	9008	Hosston	2205-9006
B-284	FRANKS & KING #1 Cummings	8804	Hosston	2244-8803
B-285	FRANKS & PETROFUNDS #1 Highland	9006	Hosston	2230-9005
B-286	SOUTHERN #1 Bailey	7727	Hosston	304-7726
B-287	PHILLIPS & PETROFUNDS #1-A Youngblood	9530	Hosston	1854-9524
B-288	FRANKS & PETROFUNDS #1 Merritt	9228	Hosston	2464-9227
B-289	FRANKS & PETROFUNDS #B-1 Woodard-Walker	9996	Hosston	2326-9995
B-290	FRANKS & PETROFUNDS #1 Cummings	8913	Hosston	2271-8912
B-291	FRANKS & PETROFUNDS #1 Streetman	9684	Hosston	2314-9683
B-292	FRANKS & PETROFUNDS #1 Smith	9514	Hosston	2258-9513
B-293	FRANKS & PETROFUNDS #F-1 Cont. Can	9885	Hosston	2485-9884
B-295	FRANKS & PETROFUNDS #A-1 Johnson	9701	Hosston	2477-9700
B-296	BUTLER-JOHNSON #1 Evans-Garner	9513	Hosston	2101-9507
B-297	ATLANTIC #2 Hamner	7665	Hosston	1403-7665
B-298	PHILLIPS #A-1 Sutton	10007	Hosston	2329-10006
B-299	FRANKS #1 Willamette	10043	Hosston	2493-10042
B-300	PHILLIPS #A-1 Calhoun	9119	Hosston	2283-9115

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-301	SOUTHERN #1 Bailey	7990	Hosston	250-7989
B-302	CRYSTAL #1 Brice	7717	Hosston	990-7716
B-303	CRYSTAL #1 Fleming	7922	Hosston	1016-7921
B-304	CRYSTAL #1 Haynesville	7925	Hosston	1009-7924
B-305	CRYSTAL #2 Holston	8002	Hosston	1004-8001
B-306	TIDEWAY ONSHORE #1 CCC	11354	Cotton Valley	4966-11348
B-307	MCGOLDRICK #2 Sherrell	9720	Hosston	1075-9714
B-308	MRT #1 Gladney	10380	Cotton Valley	2445-10375
B-309	FRANKS ET AL #1 Cont. Can	8266	Hosston	1422-8265
B-310	ARK-LA EXP. #1 Lawhon	--	--	--
B-311	UNION #1 Tooke	1443	Sligo	270-1434
B-312	ARKANSAS FUEL #1 Shehee	--	--	--
B-313	ARK-LA GAS #1 Wimberly	5210	Sligo	165-5207
B-314	UNION #1 Harvis	1359	Hosston	379-1359
B-315	ARK-LA GAS #1 Longbell	5189	Sligo	168-5189
B-317	TEXAS #1 Givens	6990	Hosston	58-6989
B-318	ATLANTIC #1 Hamner	5944	Rodessa	506-5938
B-319	BROYLES #2-A Loe	8510	Hosston	2217-8503
B-320	SOUTHERN #2 Poole	11299	Hosston	1804-11298
B-321	BROYLES #1 Poole Et Al	11898	Cotton Valley	2231-11891
B-322	SOUTHERN #1 Allison	11876	Cotton Valley	1794-11853
B-323	SOUTHERN #1 Kemp	7912	Hosston	2252-7912
B-324	SOUTHERN #1 Jordan	7398	Hosston	288-7398
B-325	SOUTHERN #1 Ford	8232	Hosston	290-8232
B-326	CROW #1 Harrison	8211	Hosston	1425-8206
B-327	PHILLIPS #A-1 Tilley	9214	Hosston	2201-9206

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-328	HUNT #A-1 Nebo	8447	Hosston	2400-8447
B-329	PLACID #1 Bodcaw	9278	Hosston	2140-9275
B-330	FRANKS #25-1 Allison	8016	Hosston	1035-8015
B-331	FRANKS #1 Martin	7913	Hosston	1093-7912
B-332	FRANKS & PETROFUNDS #5-1 Davis Bros.	8423	Hosston	537-8422
B-333	SOUTHERN # 1 Davis Bros.	8602	Hosston	2010-8602
B-334	MURPHY #1 Davis	8514	Hosston	2514-8514
B-335	SOUTHERN #1 Conville	8000	Hosston	2312-7997
B-336	SOUTHERN #1 Cont. Can	8102	Hosston	1612-8102
B-337	BROYLES & HOLLOWAY #2 Cont. Can	8611	Hosston	1438-8610
B-338	MURPHY #1 Lowe	7927	Hosston	2303-7927
B-339	SUNRAY #1 Stall	8370	Hosston	2549-8368
B-340	FRANKS & PETROFUNDS #1 Smelley	8517	Hosston	1441-8516
B-341	SUNRAY #B-1 Davis	7932	Hosston	158-7932
B-342	TRAHAN #A-1 Brown	7903	Hosston	1143-7895
B-343	TRAHAN #1 Cont. Can	8619	Hosston	1435-8618
B-344	FRANKS & PETROFUNDS #1 Caldwell	9624	Hosston	1862-9623
B-345	UNION #1 Smitherman	8038	Hosston	218-8036
B-346	PLACID #1 Wimberly	7527	Hosston	37-7520
B-347	PENROD #1 Rowell	8014	Hosston	39-8014
B-348	PLACID #A-8 Nebo	3672	Tuscaloosa	527-3666
B-349	PLACID #B-1 Nebo	7952	Hosston	1208-7952
B-350	PLACID & NEBO #1 White	7954	Hosston	1510-7947
B-351	CROW #1 Myrick	3860	Tuscaloosa	298-3858
B-352	KILPATRICK #1 Hayes	3594	Tuscaloosa	306-3594
B-353	CROW #A-1 Hayes	3525	Tuscaloosa	318-3519

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-354	PLACID #1 Bienv. Lbr.	8005	Hosston	1745-8002
B-355	PIKE & ROSS #1 Long	3605	Tuscaloosa	330-3598
B-356	A & B #1 Driggers	3800	Tuscaloosa	300-3783
B-357	BARNWELL #1 Colwell	3984	Tuscaloosa	746-3983
B-358	CARAWAY #1 Howell	3509	Tuscaloosa	221-3509
B-359	BAGLEY #2 Lacy	3505	Paluxy	180-3504
B-360	IRONS #1 Martin	3353	Tuscaloosa	400-3343
B-361	FRANKS #1 Byrd	3400	Tuscaloosa	290-3396
B-362	GULF #1 Good Pine	10770	Cotton Valley	170-10770
B-363	ROWLEY #1 Frey	3292	Tuscaloosa	500-3286
B-364	JOHNSON #1 Martin	3310	Tuscaloosa	320-3298
B-365	BLANCHARD #1 Sexton	3395	Tuscaloosa	150-3395
B-366	FRANKS & PETROFUNDS #F-1 Davis	8516	Hosston	1462-8513
B-367	FRANKS & PETROFUNDS #C-1 Davis	8521	Hosston	1417-8520
B-368	FRANKS & PETROFUNDS #9-1 Davis	8509	Hosston	1482-8508
B-369	SOUTHERN #1 Smelley	11076	Cotton Valley	1803-11075
B-370	FRANKS & PETROFUNDS #1 Hays	8525	Hosston	1446-8524
B-371	FRANKS & PETROFUNDS #B-1 Davis	8534	Hosston	1449-8533
B-372	FRANKS & PETROFUNDS #1 McConathy	9554	Hosston	1450-9553
B-373	BODCAW #7 Bodcaw 61	9816	Hosston	2156-9800
B-374	JAMES #1 Evans	8026	Hosston	2056-8014
B-375	ARK-LA GAS #1 Qualls	8352	Hosston	1437-8341
B-376	ARK-LA GAS #2 Cont. Can	8359	Hosston	1440-8355

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-377	FRANKS & KING #1 Allen	8520	Hosston	1415-8517
B-378	SOUTHERN #1 Poland	13139	Cotton Valley	1785-13134
B-379	KINSEY & KINSEY #1 Simmons	8301	Hosston	2189-8295
B-380	HUMBLE #1 Cont. Can	11600	Cotton Valley	122-11599
B-381	SOUTHERN #2 Fed. Land Bank	12367	Cotton Valley	1820-12349
B-382	BARNSDALL OIL CO. #1 Talbert	7650	Sligo	160-7650
B-383	SUNRAY OIL CORP. #C-1 Davis Bros. Lumber	8506	Hosston	150-8506
B-384	PENROD #1 Dee Van Zant	8030	Hosston	40-8030
B-385	K. W. KILPATRICK #2 H. N. Hays	3572	Austin	297-3572
B-386	MOBLEY & STEPHENS #1 G. W. Linton Et Al	3843	Ferry Lake	302-3778
B-387	T. J. JOHNSON #1 Ozley	3715	Rusk	158-3715
B-388	UNION PROD. CO. #1 Bowman	8014	Hosston	225-8014
B-389	CALIFORNIA COMPANY #1 Robert L. Calvin	13300	Cotton Valley	238-13303
B-390	PIERCE & CROW E. W. Merritt #2	2100	Midway	100-2100
B-391	BOMAR, INC. #1 E. W. Merritt	2906	Eagle Ford	156-2905
B-392	CARTER OIL CO. #1 Daisy Woodward	6850	Sligo	100-6848
B-393	C. S. SENTELL #1 Ida Milner	2863	Ozan	188-2863
B-394	SKELLY OIL CO. #1 Kendricks	2906	Mooringsport	245-2906
B-395	LOCKWOOD & LUNSFORD #B-1 Woodward-Walker Lbr. Co.	2871	Tuscaloosa	160-2871

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-396	C. S. SENTELL #2 Ida Milner	2965	Ozan	152-2865
B-397	MCCALMAN DRLG. #1 Hutton Est.	3505	Mooringsport	175-3505
B-398	TRANS TEX DRLG. #1 Drake	2901	Tuscaloosa	145-2901
B-400	PETROLEUM, INC. #1 Dixon	3940	Rusk	330-3934
B-402	J. S. RUSHING #1 Mason	7394	Hosston	100-7391
B-403	SMITH, COMEGYS, & SENTELL #3 Hutton	2852	Tuscaloosa	174-2851
B-404	UNION PROD. CO. #A-1 Drake	2280	Tuscaloosa	393-2875
B-405	MCCALMAN DRLG. #1 Mary Weller	2904	Ozan	143-2904
B-406	C. W. BEENE ET AL #1 Continental Can	1929	Midway	250-1928
B-407	L.D.P.W. Danville Test #1	554	Cane River	80-553
B-408	U.S.G.S. Friendship #1	1019	Wilcox	20-1015
B-409	L.D.P.W. Danville Test #2	550	Cane River	50-550
B-410	L.D.P.W. Southeast Bienville Test #3	344	Sparta	20-343
B-411	L.D.P.W. Southeast Bienville Test #2	286	Cane River	20-285
B-412	L.D.P.W. Southeast Bienville Test #1	283	Cane River	20-282
B-413	L.D.P.W. Old Saline Test #1	848	Wilcox	20-841
B-414	L.D.P.W. Saline #1	852	Wilcox	90-852
B-415	L.D.P.W. Saline #2	801	Wilcox	66-800
B-416	L.D.P.W. Saline Water Test #2	461	Wilcox	20-460
B-417	L.D.P.W. Old Saline System Test #2	846	Wilcox	20-843

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-418	L.D.P.W. Alberta Water Test #1	532	Wilcox	10-528
B-419	L.D.P.W. Alberta Water Test #3	306	Sparta	20-305
B-420	L.D.P.W. Alberta Water Test #1	471	Wilcox	20-469
B-421	L.D.P.W. Alberta Water Test #2	471	Wilcox	20-470
B-422	TRIANGLE PUMP COMPANY Continental Can Test #21	600	Cane River	90-593
B-423	TRIANGLE PUMP COMPANY Continental Can #17	594	Cane River	90-594
B-424	TRIANGLE PUMP COMPANY Test Hole #19	595	Cane River	85-592
B-425	TRIANGLE PUMP CO. #16 Continental Can	495	Cane River	90-494
B-426	TRIANGLE PUMP COMPANY #12 Continental Can	554	Cane River	90-553
B-427	TRIANGLE PUMP COMPANY #15 Continental Can	557	Cane River	85-511
B-428	TRIANGLE PUMP COMPANY #5 Continental Can	511	Cane River	90-510
B-429	TRIANGLE PUMP COMPANY #8 Continental Can	491	Cane River	50-490
B-430	TRIANGLE PUMP COMPANY #17 Continental Can	496	Cane River	80-496
B-431	TRIANGLE PUMP COMPANY #11 Continental Can	537	Cane River	80-937
B-432	L.D.P.W. Friendship Com. Test #1	285	Cane River	20-284
B-433	L.D.P.W. Lucky #1	650	Wilcox	20-641
B-434	LANFORD DRILLING COMPANY LSU Test Well #R-2B	1207	Midway	42-1201
B-435	LANFORD DRILLING COMPANY LSU #R-3B	1111	Midway	67-1103
B-436	DOYLE THOMAS Castor Test#1	415	Wilcox	80-415

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-437	DOYLE THOMAS Castor Test #2	494	Wilcox	100-493
B-438	L.D.P.W. Ringgold #4	504	Sparta	33-502
B-439	L.D.P.W. Mt. Olive Water System #1	681	Cane River	20-681
B-440	L.D.P.W. Mt. Olive Prod. Well #1	408	Sparta	20-407
B-441	U.S.G.S. Union CHurch Test #Bi-166	691	Cane River	20-690
B-442	SOUTHERN NAT. GAS #C-1 Hodge-Hunt	7480	Hosston	288-7480
B-443	SOUTHERN NAT. GAS #1 Fee	7601	Hosston	276-7601
B-444	SOUTHERN NAT. GASS #B-1 Hodge-Hunt	7727	Hosston	278-7727
B-445	BIENVILLE WATER SUPPLY CORP. Public Supply Well #1	328	Sparta	0-320
B-446	U.S.G.S. Test Well Bi-216	503	Cane River	20-499
B-447	PAN AM PETROLEUM CORP. #1 Continental Can	11600	Cotton Valley	112-11593
B-448	NELSON BUNKER HUNT EST. #1 Nebo Oil Co.	8250	Hosston	40-8250
B-449	PLACID OIL CO. #A-5 Nebo	7656	Hosston	40-7645
B-450	L.D.P.W. Lake Bistineau Com. Test #1	535	Wilcox	20-530
B-451	L.D.P.W Ringgold #3 Bi-86	509	Wilcox	70-500
B-452	L.D.P.W. Ringgold Water Bi-105	516	Wilcox	30-515
B-453	U.S.G.S. Water Well Bi-214	389	Wilcox	10-388
B-454	L.D.P.W. Bryceland Water Test #1	604	Cane River	20-603
B-455	L.D.P.W. Bryceland Water Well #2	643	Cane River	20-642

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
B-456	ATLANTIC REFG. CO. #1 Youngblood	5926	Ferry Lake	535-5926
B-457	HAMLIN & NOLTE #2 Dresser Minerals	265	Cane River	20-264
B-458	L.D.P.W. Central Test Well #1	581	Wilcox	22-554
B-459	U.S.G.S Alabama Bi-144	811	Sparta	20-810
B-460	ENTERPRISE PROD. Water Well #2	1183	Wilcox	100-1178
B-461	WHITEHURST & GRAGE #1 Woodward Walker	2879	Ozan	150-2876
B-462	L.D.P.W. Gibsland Test Well #1	1030	Wilcox	50-1027
B-463	L.D.P.W. Gibsland Test Well #3	520	Cane River	20-519
B-464	L.D.P.W. Gibsland Test Well #2	568	Wilcox	50-567
B-465	L.D.P.W. Gibsland Well #1	51	Cane River	20-550
B-466	L.D.P.W. Mt. Lebanon Test #1	597	Cane River	90-597
B-467	CARTER #2 Anna Walker	7587	Hosston	126-7587
BO-1	SINCLAIR #1 USA	8552	Cotton Valley	50-7738
BO-4	MOORE, CATHEY & TRANSCONT. #1 Munhollon	3873	Sligo	326-3872
BO-5	SCHNEIDER & CAREY #1 Glass	7714	Cotton Valley	1036-7712
BO-7	BARNWELL #1 West	6601	Hosston	575-6597
BO-8	SOUTHERN #1 Ardis	1308	Austin	146-1302
BO-9	WINDSOR PET. - S.W.PROD. #3 Snider	1850	Tuscaloosa	100-1849
BO-10	URBANA #1-A Wickett	1992	Tuscaloosa	75-1991

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
C-3	CARAWAY #1 Spurlock	9813	Cotton Valley	105-9813
C-4	MCGOLDRICK #1 Woodard-Walker	11303	Cotton Valley	2540-11297
C-5	CLAIBORNE RES. #1 Shaw	11106	Cotton Valley	2537-11106
C-6	CARTER #1 Caldwell	11384	Cotton Valley	120-11384
C-7	MRT #1 Gandy	11404	Cotton Valley	2525-11402
C-8	UNION #3 Durrett	12003	Bossier	3306-12003
C-9	SKELLY #1 Halsey-Bishop-Lewis	9512	Cotton Valley	50-9512
C-10	LION #1 Myra	9812	Cotton Valley	100-9812
C-11	SUN #1 Bernard	10143	Cotton Valley	125-10142
C-12	GULF #1 Miller	10761	Cotton Valley	79-10761
C-13	JONES & LINAM #1 Camp	4514	Rusk	267-4514
C-14	SKLAR & PHILLIPS #1 Woods	8521	Hosston	1476-8520
C-15	BARNWELL #1 Morgan	4012	Tuscaloosa	410-4006
C-16	BARNWELL #1 Frye	12063	Cotton Valley	1536-12059
C-17	CARTER #1 Gandy	11002	Cotton Valley	9850-11000
J-4	TEMPLETON #1 Henry	10522	Hosston	1871-10518
J-5	JAMES #1 Machen	12012	Cotton Valley	231-12012
J-6	PLACID #B-1 Cont. Can	10514	Hosston	50-10513
J-7	MONSANTO #1 Masters	9114	Hosston	1862-9110
J-8	WATSON #1 Luzader	9968	Hosston	1790-9962
J-9	KLEIN & CARUTHERS #1 Walsworth	10855	Cotton Valley	1819-10849

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
J-10	HUNT #1 Peavy	10017	Hosston	1954-10017
J-11	PAN AMERICAN #8-1 Davis Bros.	11799	Cotton Valley	52-11799
J-12	WOLF'S HEAD #1 Davis Bros	9214	Hosston	2606-9210
J-16	ARK-LA GAS #1 Bryant	8466	Hosston	1429-8462
J-17	ADA #1 Wheatley	8836	Hosston	1841-8832
J-18	MACHIN #1 McBride	7914	Hosston	1302-7913
J-19	KING #1 Cont. Can	8915	Hosston	1440-8914
J-20	HODGE HUNT LUMBER CO. #A-2 Continental Can	4374	Rusk	397-4374
J-21	U.S.G.S. Beech Springs Test	814	Cane River	20-810
J-22	L.D.P.W. Bear Creek Water System #3	643	Wilcox	20-636
J-23	LA. WELL CO. Sou. Adv. Bag & Paper Test #8	705	Cane River	80-704
J-24	L.D.P.W. Bear Creek #2	643	Wilcox	20-642
J-25	B. F. EDDINGTON Bear Creek #2	590	Cane River	100-590
J-26	L.D.P.W. Sou. Adv. Bag & Paper Test #6	745	Cane River	50-745
J-27	L.D.P.W. Sou. Adv. Bag & Paper Test #17	608	Cane River	80-607
J-28	LOUISIANA WELL CO. Sou. Adv. Bag & Paper	720	Cane River	50-718
J-29	HOLIDAY WELL CO. Sixth Street Test Well	602	Cane River	77-589
L-1	MURPHY #2 Givens	6998	Hosston	2518-6998
L-3	EVERETT-HOLLOWAY-LYONS #1 Durrett	8802	Hosston	1400-8796
L-4	CAMCO #1 Arcadia Nat. Bank	8004	Hosston	1617-8004
L-5	MOORE #1 Commercial Real Estate	6210	Rodessa	2900-6206

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
LH-2A*	D.O.E. LA. POWER & LIGHT - LH-2A	1850	Nacatoch	400-1832
LH-2B*	D.O.E. LA. POWER & LIGHT - LH-2B	752	Wilcox	654-743
LH-2WS*	D.O.E. LA. POWER & LIGHT - LH-2WS	420	Wilcox	20-419
LH-7A*	D.O.E. CONT. FOREST IND. - LH-7A	2619	Marlbrook	58-2617
LH-7B*	D.O.E. CONT. FOREST IND. - LH-7B	1052	Wilcox	936-1052
LH-7WS*	D.O.E. CONT. FOREST IND. - LH-7WS	743	Cane River	125-741
LH-17A*	D.O.E. CONT. FOREST IND. - LH-17A	2400	Austin	47-2392
LH-17B*	D.O.E. CONT. FOREST IND. - LH-17B	1385	Nacatoch	45-1317
LH-17WS*	D.O.E. CONT. FOREST IND. - LH-17WS	502	Wilcox	30-492
LRH-13A*	D.O.E. CONT. FOREST IND. - LRH-13A	1485	Midway	70-1488
LRH-13B*	D.O.E. CONT. FOREST IND. - LRH-13B	667	Wilcox	70-561
LRH-13WS*	D.O.E. CONT. FOREST IND. - LRH-13WS	365	Cane River	25-364
LVH-6A*	D.O.E. CONT. FOREST IND. - LVH-6A	3000	Austin	87-3002
LVH-6B*	D.O.E. CONT. FOREST IND. - LVH-6B	1935	Nacatoch	37-1933
LVH-6C*	D.O.E. CONT. FOREST IND. - LVH-6C	985	Wilcox	88-910
LVH-6WS*	D.O.E. CONT. FOREST IND. - LVH-6WS	144	Cane River	8-142
N-2	PLACID #1 Pardee	16600	Salt	118-16600
N-3	HUNT #F-14 Goodpine	5788	Rusk	465-5738
N-4	HAWTHORNE #1 Bodcaw	9007	Sligo	2456-9006

* Area Characterization Wells

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
N-6	PLACID #17 Edenborn	8184	Sligo	2548-8183
N-7	HUNT #F-142 Nebo	7652	Sligo	100-7652
N-8	HUNT #F-23 Goodpine	4734	Rusk	610-4735
N-10	FRANKS & MCRAE #1 Foster	3378	Tuscaloosa	302-3377
N-11	MARJA #1 Atlantic-Richfield	3291	Tuscaloosa	290-3290
N-12	CROW & ECHOLS #1 Johnson	3347	Tuscaloosa	308-3346
N-13	WESTGATE GREENLAND #1 Barron Est.	3343	Tuscaloosa	296-3343
N-15	HUNT #1 Nebo	5500	Rusk	494-5500
N-16	BODCAW #2 Fee	8288	Sligo	1445-8287
N-17	BARNWELL & CRESLENN #1 Edenborn	8649	Hosston	2336-8648
N-18	ECHOLS & AMER. MANAGEMENT #1 Foster-Knotts	3388	Tuscaloosa	307-3387
N-19	ROSS #1 Morrison	3343	Tuscaloosa	313-3342
N-20	CROW & ECHOLS #1 Atlantic-Goldston	3320	Tuscaloosa	325-3319
N-21	L.D.P.W. Saline Test #1	786	Wilcox	20-785
RR-1	WALBERT #1 Rachal	6969	Hosston	870-6968
RR-2	HARGRAVES & SONS #1 Fielder	3270	Tuscaloosa	294-3264
RR-4	TESORO #1 Martin Timber	7004	Hosston	996-7003
W-26	MANSFIELD #1 Mansfield	6335	Rusk	20-6335
W-27	VINCENT & WELCH #1 Price	1731	Wilcox	100-1730
W-28	HUNT #F-24 Goodpine	9720	Hosston	934-9720
W-31	NAYLOR #1 Terall	6011	Rusk	160-6011
W-32	MOBIL #1 Taylor	8266	--	1537-8265

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
W-33	HUNT #F-134 Goodpine	8003	Sligo	271-8003
W-34	BODCAW #3 Fee	9801	Sligo	1429-9800
W-35	BODCAW #4 Bodcaw	9221	Sligo	1426-9220
W-36	GRIGSBY-FRANKS & TENNECO #1 Tremont	9414	Sligo	800-9413
W-37	PLACID #1 Cont. Can	9137	Hosston	46-9136
W-38	CONT. CAN #1 Mansfield	10558	Hosston	50-10558
W-41	PLACID #1 Zuber	9007	Sligo	80-9006
W-42	KADANE #1 Callon	692	Wilcox	160-691
W-43	L.D.P.W Gansville Test #140	650	Cane River	20-650
W-44	G. E. KADANE & SON ET AL John S. Callon Agent 7-8-5	2180	Midway	120-2180
W-45	L.D.P.W. Brewton Mill #W-111	500	Midway	40-500
WB-2	CARTER #1 Mott	7106	Hosston	1545-7106
WB-2A	RUSHING #1 Woodard-Walker	5673	Rodessa	576-5673
WB-3	CARTER #1 Colbert-Davis	5469	Rodessa	506-5469
WB-4	TEMPLE #1 Woodard-Walker	1872	Nacatoch	168-1870
WB-5	STEWART #1 Woodard-Walker	3626	Tuscaloosa	103-3626
WB-6	PAN AMERICAN #1 Rowland	8962	Hosston	1436-8956
WB-7	CARTER #2 Walker	7302	Hosston	1489-7302
WB-8	CARTER #1 Johnson	7840	Rodessa	523-5835
WB-9	GREAT WESTERN #1 Moore	7411	Hosston	2034-7410
WB-10	MONTGOMERY #1 Woodard-Walker	4289	Salt	530-4289
WB-11	COULSTON #1 Walker	5828	Rodessa	524-5827

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
WB-12	LSU #V-4	752	Midway	80-746
WB-13	SHULER #1 Scott	5367	Pine Island	409-5366
WB-14	STEWART #1 Test Hole	1186	Nacatoch	40-1107
WB-15	LSU #V-7	848	Salt	32-845
WB-16	SHULER #1 Moore	5320	Salt	623-5183
WB-17	MOFFITT & PERRITT #2 Fudicker	5729	Rodessa	717-5728
WB-92A	CROW & FORD #1 Jordan	946	Caprock	50-946
WB-18	SKELLY #1 Glass	6644	Sligo	827-6644
WB-19	SIBLEY SABINE #1 McDonald	6279	Sligo	1500-6278
WB-20	HALSTEAD #1 Collingsworth	6553	Sligo	821-6552
WB-21	TRIDENT #1 Ward	6705	Sligo	803-6683
WB-22	MOBLEY & STEPHENS #1 Perryman	7246	Hosston	1085-7240
WB-23	PLYMOUTH #1 Perryman	9175	Hosston	1029-9175
WB-24	PHILLIPS #3 Davis	9026	Hosston	1886-9020
WB-25	PLYMOUTH #17-1 Alexander	7234	Hosston	1027-7228
WB-26	PLYMOUTH #1 Bradford	7587	Hosston	1022-7581
WB-27	PLYMOUTH #1 Smith	8001	Hosston	1010-7994
WB-28	DELTA CARIBBEAN #1 Gibbs	6818	Sligo	839-6818
WB-29	DORAN & BRADDOCK #1 Perryman	10608	Cotton Valley	100-10604
WB-31	PHILLIPS #2 Davis	9024	Hosston	1804-9018
WB-32	PHILLIPS #M-1 Walker	9026	Hosston	1845-9020
WB-33	UNION #1 Walker	10382	Hosston	50-10382
WB-34	CROW #A-1 Davis	7600	Hosston	528-7314
WB-35	CARTER #3 Davis	14146	Bossier	440-14146

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
WB-36	PLYMOUTH #1 Alexander	7234	Hosston	1016-7228
WB-37	PLYMOUTH #1 Crichton	8007	Hosston	1025-8004
WB-38	MARITZKY & BIBBY #1 Cook	1738	Arkadelphia	160-1633
WB-39	WILSON #1 Howell	4516	Paluxy	848-4516
W-39A	EVANS #1 Worsham	8612	Hosston	1420-8611
WB-40	DELTA #1 Glass	8941	Hosston	1506-8941
WB-41	ATLANTIC #1 Glass	5841	Rodessa	100-5840
WB-42	CROW-GREYHOUND #1 Smith	8502	Hosston	627-8497
WB-43	CROW-GREYHOUND #1 McGinty	7495	Hosston	621-7489
WB-44	SHAVER #1 Stewart	2506	Austin	82-2506
WB-45	TIDEWATER #1 Pipes	6785	Rodessa	3568-6785
WB-46	SMACKOVER #1 Carter	3320	Tuscaloosa	183-3310
WB-47	HASSIE HUNT #1 Hamner	300	Austin	552-3003
WB-48	CRESLENN #1 McDowell	4000	Rusk	307-3999
WB-49	HUNT #1 Gerard	9823	Pine Island	1012-9781
WB-50	BARNWELL #1 Gruner	8511	Hosston	1400-8510
WB-51	BARNWELL #6 Minden	8462	Sligo	--
WB-52	WHITTINGTON # 1 Almond	6880	Hosston	828-6886
WB-53	BARNWELL #14 Minden	--	Cotton Valley	--
WB-54	BARNWELL #1 Hudson	7682	Paluxy	1395-7681
WB-55	PAN AMERICAN #3 Hudson	11206	Cotton Valley	1801-11205
WB-56	BARNWELL #1 Lee	7779	Paluxy	--
WB-57	BARNWELL #2-D Lee	7901	Rusk	1020-7897
WB-58	BARNWELL #C-1 Minden	8061	Rusk	1430-8060
WB-59	BARNWELL #3 Barnwell Minden	8235	Paluxy	1430-8234

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
WB-60	BARNWELL #8 Minden	7500	Paluxy	1435-7496
WB-61	BARNWELL #11 Minden	7920	Paluxy	1450-7920
WB-62	BARNWELL #12 Minden	7712	Paluxy	--
WB-63	BARNWELL #1 Nield	7656	Paluxy	--
WB-64	PAN AMERICAN #1 Nield	12332	Bossier	2382-12329
WB-65	HUNT #2 Harris	6825	Cotton Valley	1001-6824
WB-66	ROSS & BEAIRD #1 Hatchett	3217	Nacatoch	--
WB-67	HUNT #2 Hatchett	8190	Paluxy	1451-8189
WB-68	ROSS & BEAIRD #2 Hatchett	3208	Salt	177-3208
WB-69	CROW #1 Lewis	2267	Salt	94-2220
WB-70	BARNWELL #1 Sims	7233	Cotton Valley	1947-7232
WB-71	BARNWELL #2 Sims	8250	Hosston	1030-8249
WB-72	BARNWELL #3 Sims	6851	Hosston	1500-6846
WB-73	HOOKER #1 Walker	1568	Wilcox	214-1511
WB-74	PARKER #1 Watkins	1519	Wilcox	107-1518
WB-75	CRYSTAL #1 Crisler	7713	James	995-7712
WB-76	BARNWELL-RUSHING #2 Gruner	7286	Hosston	1435-7283
WB-77	BARNWELL #3 Gruner	7238	Hosston	1050-7237
WB-78	BARNWELL #4 Gruner	6811	Hosston	1050-6792
WB-79	BARNWELL #5 Gruner	6544	Paluxy	1020-6493
WB-80	BARNWELL #A-1 Lewis	6612	Cotton Valley	1207-6603
WB-81	BARNWELL-RUSHING #2 Lewis	6559	Rodessa	916-6558
WB-82	BARNWELL-RUSHING #A-1 Minden	7806	Cotton Valley	1450-7799

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WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
WB-83	BARNWELL #5 Minden	8275	Cotton Valley	1400-8273
WB-84	BARNWELL #7 Minden	6820	Cotton Valley	1423-6818
WB-85	BARNWELL #7-A Minden Unit	6853	Cotton Valley	1420-6851
WB-86	BARNWELL #9 Minden	6978	Cotton Valley	1450-6977
WB-87	BARNWELL & RUSHING #9-A Minden	9969	Smackover	1415-9968
WB-88	RUSHING #1 Sale	7319	Hosston	1060-7313
WB-89	BARNWELL #3 Sale	6830	Cotton Valley	915-6791
WB-90	PAN AMERICAN #1 Walker	7696	Hosston	50-7646
WB-91	PAN AMERICAN #1 Grigsby	9193	Cotton Valley	41-9170
WB-92	EXCHANGE #1 Lee	8851	Cotton Valley	1536-8844
WB-93	PAN AMERICAN #1 Lee	7442	Cotton Valley	40-10020
WB-94	HUNT #1 Beatty	9606	Cotton Valley	58-9602
WB-95	PAN AMERICAN #1 Liles	8492	Hosston	90-8484
WB-96	BARNWELL #1 Liles	7460	James	1122-7427
WB-97	WHELESS #1 Cook	1907	Salt	326-1906
WB-98	HOOKER #1 Cook	1479	Caprock	210-1478
WB-99	OSTROM #1 Cook	963	Wilcox	26-800
WB-100	HOOKER #2 Cook	2064	Caprock	212-2059
WB-101	HOOKER #1 Jones	1164	Caprock	212-1163
WB-101A	Hooker #2 Jones	1063	Wilcox	325-1062
WB-102	HOOKER #1 Stanley	1467	Caprock	220-1466
WB-103	WHELESS #1 Hougn	7781	Hosston	1010-7781
WB-104	PAN AMERICAN #1 Cox.	10476	Bossier	1802-10474

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 31 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
WB-105	BARNWELL #1 Cox	7816	Paluxy	1027-7815
WB-106	WHELESS #1 Cox	7475	Rusk	1017-7474
WB-107	PAN AMERICAN #1 Hudson	11604	Norphlet	182-11598
WB-108	PAN AMERICAN #2 Hudson	3433	Salt	540-2398
WB-109	BARNWELL #1 Minden	7787	Paluxy	1016-7786
WB-110	WHELESS #1 Winget	7751	Rusk	1015-7751
WB-111	PAN AMERICAN #1 Youngblood	7650	Rusk	60-7648
WB-112	PAN AMERICAN #2 Youngblood	11290	Cotton Valley	1800-11288
WB-113	PAN AMERICAN #3 Hudson	6532	Paluxy	526-6526
WB-114	CROW DRLG. #1 Winget	7636	Paluxy	1024-7635
WB-115	HUMBLE #1 Cox	7914	Hosston	1101-7913
WB-116	PAN AMERICAN #2 Cox	10283	Bossier	1825-10278
WB-117	HUMBLE #1 Cox-Spradley	8016	Rusk	1106-8015
WB-118	PAN AMERICAN #1 Goodwill	7917	James	1031-7916
WB-119	WHELESS #1 Grayden	8319	James	1042-8318
WB-120	VICTORY #1 Sentell	10413	Cotton Valley	2332-10407
WB-121	HUNT #1 Pilkinton	10007	Cotton Valley	2249-10006
WB-122	WHELESS #1 Young	7830	Hosston	1003-7829
WB-123	WILLIAMS #1 Griffith	5892	Paluxy	1600-5150
WB-124	SKLAR #1 McLaughlin	9304	Hosston	1517-9303
WB-125	MONSANTO #1 Morton	8501	Pine Island	1515-8493
WB-126	MONSANTO #1 Floy	8530	James	1520-8504
WB-127	BARNWELL #1 Floy	8145	Sligo	1027-8144
WB-128	MONSANTO #1 Moess	8325	James	1497-8314

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 32 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
WB-129	BARNWELL #B-1 Minden	8684	Paluxy	1450-8010
WB-130	HUMBLE #1 West	8000	Ferry Lake	1054-7994
WB-131	HUMBLE #1 Miller	8013	Rusk	1043-8008
WB-132	FEAZEL #1 Drake	11010	Cotton Valley	82-11004
WB-133	WHELESS #1 Wren	6153	Rusk	714-6152
WB-134	BASS #1 Crichton	6413	Rusk	1155-6411
WB-135	TENNECO #1 USA	11607	Cotton Valley	3698-11601
WB-136	NAT. GAS & OIL #1 Devereau	8145	Hosston	1046-8144
WB-137	WILSON #1 Willis	6143	Rodessa	925-6143
WB-138	MUSLOW #1 Drake	4516	Nash-Fred.	513-4516
WB-139	DUKAS #1 Waugh	7362	Cotton Valley	750-7362
WB-140	SKELLY #1 Stewart	7780	Cotton Valley	905-7778
WB-141	BUTLER-JOHNSON #1 Braswell	5760	Rodessa	584-5754
WB-142	FEAZEL #1 Tillman	6070	Rodessa	1948-6070
WB-143	CARTER #1 Johnson	7840	Hosston	70-7840
WB-144	ARCADIA #1 Brunson	3300	Tuscaloosa	308-3299
WB-145	RELIANCE #1 Johnson	4503	Paluxy	516-4502
WB-146	PLACID #1 Roberts	5943	Hosston	1312-5938
WB-147	CRYER & NELSON #1 White	10861	Cotton Valley	2345-10861
WB-148	SKELLY #1 Williamson	7102	Hosston	1020-7101
WB-149	CARTER #1 Johnson	6690	Hosston	1483-6686
WB-150	ATLANTIC #1 Butler	7028	Hosston	132-7028
WB-151	ATLANTIC #1 Nicholson	7101	Hosston	898-7101
WB-152	SKLAR #1 Batton	6812	Sligo	1024-6812

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 33 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
WB-153	SKLAR #1 Kennon	6605	Sligo	803-6598
WB-154	ATLANTIC #2 Connell	6931	Hosston	905-6931
WB-155	WILSON #C-1 Crichton	6735	Sligo	1144-6735
WB-156	CROW #B-1 Cook	7062	Hosston	806-7061
WB-157	PLASTER #1 Bass	8009	James	810-8009
WB-158	HUNT #1 Ward	8538	Rodessa	100-8537
WB-159	ATLANTIC #1 Holley	10787	Cotton Valley	802-10787
WB-160	HOOD, GOLDSBERRY & FORTUNE #1 Dietrich	9906	Hosston	1914-9900
WB-161	ATLANTIC REFNG. #1 Gray West	5777	James	50-5777
WB-162	ATLANTIC REFNG. #1 Drew Unit	5906	James	70-5906
WB-163	FRANKS PETRO. & PETROFUNDS #2 Mae Williamson	8019	Hosston	60-8011
WB-164	ATLANTIC REFINING CO. #1 Reed	5920	James	100-5902
WB-165	CARTER OIL CO. #3 Woodward Walker	7664	Hosston	110-7664
WB-166	ATLANTIC #1 Johnson	5901	Rodessa	80-5901
WB-167	ATLANTIC REFINING CO. #1 Vice	5859	Paluxy	80-5859
WB-168	ATLANTIC #1 Roberts	5801	Rodessa	70-5801
WB-169	L.D.P.W. #1 Bistineau	503	Wilcox	130-501
WB-170	L.D.P.W. #2 Bistineau	567	Wilcox	20-566
WB-171	L.D.P.W. #2 Bistineau Wb-333	463	Wilcox	20-462
WB-172	L.D.P.W. Bistineau Park #2	401	Wilcox	20-400
WB-173	L.D.P.W. Bistineau #2 Wb-337	444	Wilcox	20-443
WB-174	L.D.P.W. Palmetto Beach #1	502	Cane River	20-501

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 34 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (Ft.)	Formation/Group at Termination	Logged Interval (ft.)
WB-175	L.D.P.W. Dubberly Test #3	516	Cane River	20-513
WB-176	L.D.P.W. Dubberly Test #2	400	Cane River	90-398
WB-177	L.D.P.W. Dubberly Water System #1	514	Wilcox	20-513
WB-178	L.D.P.W. Dubberly Test #4	577	Midway	20-576
WB-179	L.D.P.W. Dixie-Overland Test #1	578	Midway	20-577
WB-180	L.D.P.W. Sibley Test Well #2	411	Cane River	0-410
WB-181	L.D.P.W. Sibley Test #1	400	Wilcox	50-399
WB-182	L.D.P.W. Dubberly Test #1	288	Cane River	80-286
WB-183	L.D.P.W. Salt Works Community #1	503	Wilcox	20-502
WB-184	L.D.P.W. Concord Test #1	601	Wilcox	20-598
WB-185	L.D.P.W. Jenkins Water Test #1	320	Wilcox	70-320
WB-186	L.D.P.W. Jenkins Water Test #2	348	Wilcox	40-347
WB-187	U.S.G.S. Beech Springs Test #1	701	Sparta	50-700
WB-123	WILLIAMS & PATTERSON #1 Griffith	5892	Paluxy	1600-5150
WB-188	L.D.P.W. Germantown Test #1	510	Cane River	64-504
WB-189	L.D.P.W. Minden Test #1	498	Cane River	20-497
WB-190	L.D.P.W. Dixie-Overland #2	681	Sparta	27-679
WB-191	L.D.P.W. Bishop Hog Farm #2	646	Cane River	20-645

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NORTH LOUISIANA STUDY AREA

APPENDIX A-4

TABLE A-4.1 (Page 35 of 35)

WELLS USED IN ANALYSES

LETCo Well Number	Well Name	Total Depth (ft.)	Formation/Group at Termination	Logged Interval (ft.)
WB-192	L.D.P.W. Minden Test #4	347	Cane River	25-346
WB-193	L.D.P.W. Minden Test #5	300	Cane River	20-299
WB-194	L.D.P.W. Minden Test #6	279	Sparta	20-278
WB-195	L.D.P.W. Minden Test #3	362	Cane River	75-361
WB-196	L.D.P.W. Village Water Test #1	282	Sparta	20-279
WB-197	L.D.P.W. Concord Com. Test #2	594	Wilcox	20-593
WB-198	L.D.P.W. #3 Bistineau	504	Wilcox	30-503
WB-199	L.D.P.W. #1 Heflin	603	Wilcox	45-597
WB-200	L.D.P.W. Salt Works Com. #2	500	Wilcox	20-498
WB-201	KIN ARK OIL CO. #1 M. Braswell	2277	Ozan	168-2277

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NORTH LOUISIANA STUDY AREA

APPENDIX A-5

WASTE DISPOSAL WELLS

Figure 11-15 of Volume IV shows the locations, and Table 11-6 summarizes the locations, operators, injection intervals, and average injection rates for waste disposal wells in the study area.

APPENDIX B

Sample Analysis

NORTH LOUISIANA STUDY AREA

APPENDIX B-1

PALEONTOLOGICAL DATA

Samples from the deepest Area Characterization wells at all five sites in Louisiana underwent paleontological examination by Dr. Louis de A. Gimbrede, consultant to LETCo.

Most of the samples examined were processed drill cuttings. Sidewall cores were also examined, when available. The drill cuttings were generally obtained at 3-meter (10-ft) intervals.

The drill cuttings and sidewall cores were processed according to LETCo Engineering Procedure No. 2.1 (Section A), "Sample Handling and Description" and were then oven-dried, boiled in hot water and sodium carbonate, and again dried on a hot plate or in an oven in preparation for paleontological analysis.

The samples were examined microscopically by the consulting paleontologist. The fossil assemblages were used to identify biostratigraphic markers which are correlatable to units of the geologic column. Lithologic descriptions were also provided for most of the samples examined. The investigator's findings were transmitted to LETCo in the form of letter reports included in this Appendix. The locations of the wells are shown in Figure A-4.1.

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Louis de A. Gimbrede

Micropaleontology
Stratigraphy
Structure

Geological Consultant

FILE # 19
LAW ENGINEERING TESTING COMPANY
Job Name: Gulf Coast Supermes
Job Number: MV 9530.20
Lease Name: D.O.E. – Cont. Forest Ind.
Well No: LVH-6A No. 1
Sec. 35 TWP. 17N RGE. 8W
f.l. # 19

117 Horseshoe Dr.
Lafayette, Louisiana 70503
Phone (318) 232-0537

October 6, 1980

Dr. James Clark
Law Engineering Co.
Minden, La. 71055

Dear Dr. Clark:

Since my last letter, report and invoice I have been engaged in working the paleontology of wells "6-A" and "17-A" and submit herewith a report on that work and an invoice covering the last part of September and early October to cover the time spent on those two wells. In accordance with our telephone con caersation of a few minutes ago I shall procede to make slides of the critical parts of these two wells in order that we may have a reference set for comparison with future wells in this or any other locality in which we may penetrate these formations.

A sommary of the points determined follows:

Well # 6-A

00-100	No samples
100-190	Sparta Sd. No fauna
190-250	Cane River: Robulus caneriverensis, Caratobulimina eximia Eponides sp., Textularia sp., Discorbis, Siphonina, other typical Cane River Foraminifera; glauconite abd.
250-430	Queen City Reklaw, Carrizo equivalent: This section can be divided into the formations in some portions of East Texas but in Louisiana there is mostly unfossiliferous sand below a sequence of unfossiliferous glauconite which seems to be at the bottom of the Cane River.
430- 1210	Wilcox: This is the forst sample which contains a large amount of lignite and is therefore considered to be the top of the Wilcox Group.
1210- 1660	Porters Creek: This is the upper Paleocene Midway Gr. composed of dark shale of euxinic type containing a very limited fauna marked by Ammobaculites midwayensis and increased glauconite plus a few other arrenaceous Foraminifera.
1660-1750	"Marine Midway": these beds have an abundant marine fauna of Paleocene type which resembles the Kincaid Formation of Texas. The fact that it is somewhat thin and lacks certain guide fossils for the bottom of the Kincaid indicates that the disconformity between the Paleocene and the Cretaceous is somewhat larger at the expense of the early Paleocene. Also the thickness of the Porters Creek indicates that the sea was not able to break through the barrier in this area as early as it did in most of the Texas area west and south of the Sabine uplift.
1750-1810	Navarro Gr.: This interval contains a typical upper Navarro fauna with Globotruncana arca, and striate Gumbelina prominent members of these upper Cretaceous bed faunas.
1810-2050	Nacatoch Sd.: This basal sand of the Navarro has a very sparse fauna in rather loosely cemented sand.

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Well # 6-A Continued

2050-2260 Upper "Taylor" clay: These are the beds below the Nacatoch Sand and the "Pecan Gap" Chalk. There is a somewhat increased fauna here marked by Planulina taylorensis, Cibicides nelsoni, & Anomalina henbesti. There is usually an increase in the abundance of Inoceramus and a few other characteristic organic remains.

2260- 2350 Pecan Gap Chalk: marked by the presence of very chalky sediment but not by any particular Foraminifera.

2350-2920 Lower Taylor clays: no particular faunal changes to be noted.

2920-3000 In Austin Chalk equivalent: This material is a sandstone of medium grey color with white chalky cement. The lithology starts above this level at approximately 2800 feet but this point (2920) is the top of the foraminifer Vaginulina regina which is strictly limited to beds of Austin age. The sandstone above may be considered to be the Wolf City Sand which, in this area, is much thicker than in the Austin localities and so here blends into the sand of Austin age here. The presence of sand in this locality is due to the proximity of the Ouachita Mts. of Arkansas which were the source of the sediment deposited here.

3000 ft. is Total Depth of this well.

****

Well # 17-A

0- 120 Surface through Quaternary materials. Lowest sediment is fine gravel with grains 1/8 in. to ¼ in. diameter.

120-690 Wilcox: fine sand and lignite, no fauna

690-1140 Porters Creek: glauconite common, Ammobaculites midwayensis, Haplophragmoides, Trochammina, etc. all common.

1140-1230 Marine Midway: Probably equivalent to the Kincaid Fm. of Texas. The remarks on this material in the report on well #6-A are also applicable here.

1230-1540 NavarroGr. probably Arkadelphia Fm.: Globotruncana arca, Cumbelina spp.-striate type, Inoceramus prisma, etc.

1539-1540 Nacatoch Sd.: well cemented pepper & salt sand with lime cement and rare fauna.

1540-1720 Taylor: These upper Taylor clays contain common Planulina taylorensis, Cibicides nelsoni, & Anomalina henbesti indicating that a new stratigraphic group of formations has been entered.

1720-1920 Pecan Gap Chalk: This formation is marked by a more calcareous lithology of chalk type.

1920-1990 Lower Taylor Clay: Very abundant fauna with rather frequent Hunnoryxa christmani mark these beds as below the Pecan Gap and above the Austin.

1990-2290 Wolf City Sand and lower Taylor marls: identified merely by the sandy nature and lack of fossils. This sand only occurs in northeast Texas and there it is a rather distinct unit with more marl and clay before the top of the Austin Chalk is reached. As mentioned in the #6-A well there is much more sand in this section in the Louisiana area than west and south of the Sabine Uplift.

2290-2390 Rather dark sand (graywake) probably of upper Austin age but not easily different from the Wolf City beds in Well #6-A

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Well # 17-A continued

Unlike the lower beds of Well # 6-A these beds do not contain the critical foraminifer Vaginulina regina which is limited to Austin age sediments, regardless of lithology, so although we can be fairly sure this is equal in time to the beds a little above the bottom of well # 6-A it is impossible to say exactly where they lie stratigraphically and how much, if any, section is missing or added.

3390 T.D. There were no Vaginulina regina specimens in any of the lower samples in this well so that point was not reach and this well can be considered as stopping at a higher stratigraphic level than did # 6-A.

As mentioned above, I will make slides of the critical samples in these two wells in order that we may have fossils for reference and comparrison and to show what faunal changes occur on the basis of which the various points may be identified.

Respectfully submitted,

Louis de A. Gimbrede

Louis de A. Gimbrede, Ph.D.
Consulting Paleontologist

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FILE # 19
LAW ENGINEERING TESTING COMPANY
Job Name: Gulf Coast Salt Domes — La.
Job Number: MV 9630 20
Lease Name: D.O.E. — Cont. Forest Ind.
Well No.: LVH-6A No. 1
Sec. 35 TWP. 17N RGE. 8W

OCT 8 1980

p.1 of 1.

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LAW ENGINEERING TESTING COMPANY
Job Name: Gulf Coast Salt Domes – La
Job Number: MV 9630 20
Lease Name: D.O.E. – Cont. Forest In
Well No.: LVH-6A No. 1
Sec. 35 TWP. 17N RGE. 8W

December 4, 1980

Dr. James Clark
Law Engineering Co.
P.O.Box I
Minden, La. 71055

file #19

Dear Dr. Clark:

As promissed you will find herewith a report on the last two wells, LH 17A & LVH 6A, which incorporates my investigations of the normal samples and the sidewall cores recently sent me. Also I am sending the logs of the two wells with points spotted on the electric logs (I would like Xerox copies of these if possible for my files so please send them at your earliest convenience) as requested by Alison.

You will see from the balance of the report that there is really no discrepancy between my findings and those of the other people who have worked on the wells except what is caused by sample "lag" and certain differences in nomenclature based merely on the accepted useage of those engaged in the operation. The most important difference is in the placing of the top of the Cretaceous. You will see that that point has been placed at the first marine material below the top of the Porters Creek, Midway. In my concept the top of the Cretaceous is where the first fossils of that age occur. This is, in our two wells, below the first marine beds since they are some portion of the "Midway" group which predates the Porters Creek and postdates the true Cretaceous. What I am saying is that there are beds of Paleocene age which were deposited under marine conditions following a time of no deposition, indicated by "Disconformity" which cuts out various portions of the Paleocene and the uppermost Cretaceous sediments. Since the omitted portions are not always the same or of the same size there are, in some places more lower Paleocene (Midway) and sometimes more uppermost Cretaceous materials. All this makes very interesting investigatory work and sometimes has much to do with why certain markers are not present and consequently with the accuracy of the interpretacion of electric logs. One must always keep in mind that electric logs do not indicate the presence or nature of the fossils contained in the rocks and therefore do not indicate the age of the beds penetrated - only when all is well do such logs offer a satisfactory answer to our questions.

At this poitn I will stop this note to you and refer you to the enclosed logs and report.

Thank you for all your past courtesies and a most pleasant relationship with not only you personally but with all the fine people assembled in the field office at Minden. It has certainly been a fine and rewarding experience to have been privaledged to work with you and all of them. I hope we may continue to pursue these investigations in the near future.

Most sincerely,

Louis de A. (Monte) Gimbrede

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Louis de A. Gimbrede

Geological Consultant

Micropaleontology
Stratigraphy
Structure

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LAW ENGINEERING TESTING COMPANY
Job Name: Gulf Coast Salt Domes – La
Job Number: MV 9630.20
Lease Name: D.O.E. – Cont. Forest Ind.
Well No.: LVH-6A No. 1
Sec. 35 TWP. 17N RGE. 8W
F.L. #19

December 4, 1980

To the Law Engineering Co.,
Marietta, Georgia. 30067

A Report of investigations on two wells in the Minden area of Louisiana: Wells LVH 6A & LH 17A.

Recently received sidewall cores from well LH 17A, depths 1210, 1500, 1810, and 1980 and from well LH 6A, depths 1650,1730,2320, 2500 and 3003 have been examined with essentially no change in the stratigraphic picture as previously reported. –

It seems appropriate at this time to make some remarks about the Lower Paleocene and Cretaceous portions of the section in the area under examination. It is my hope that these expressions of my present thinking may be useful in guiding us to more satisfactory concepts in future investigations wherever they may be made.

The Webster-Bienville-Bossier Ph. is on the east and southeast flank of the Sabine Upliftand therefore the sedimentation pattern is influenced by that major structural feature. Some of this influence is apparent in the somewhat different sections presented by the two wells under our consideration. Well #17A is 8 miles south and 10 miles west of well # 6A and 17A is at an elevation of 270 ft. while 6A is223 ft above sea level. Therefore if there were no structural difference and no stratigraphic thickenning or thinning or change of facies the points in one should be the same as in the other except for well #6A having its points 50 ft. shallower than those in 17A. The table below shows that this is not so and will also point out some other discrepancies and similarities of one for the other:

Difference	Well #6A	Stratigraphy	Well # 17A
	170	Cane River	not present
280	400	Wilcox	120
520	1210	Porters Creek (Midway)	690
520	1660	Marine Midway	1140
500	1730	Top Cretaceous	1230
530	2250	Anona chalk	1720
510	2330	Ozan	1820
550	2540	Austin	1990
380	2920	Vaginulina regina	not present

Some comparison shows the 6A well to find each point approximately 500+ feet deeper than it is in the 17A well, this difference increases somewhat with depth. A large amount of the increased depth is due to the Wilcox being more complete in the 6A well and this is probably due to its downdip position on the Sabine Uplift. One might think that the 17A well is on a portion of the uplift which was undergoing erosion during Wilcox time while the # 6A well is on a receiving portion of the uplift - presumably the upper portion of the Wilcox is missing in the 17A locality. One might also conclude that early Eocene was a time of uplift for the Sabine feature.

In considering stratigraphic correlation and nomenclature

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Louis de A. Gimbrede
Geological Consultant

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LAW ENGINEERING TESTING COMP.
Job Name: Gulf Coast Salt Domes – La
Job Number: MV 9630.20
Lease Name: D.O.E. – Cont. Forest Ind.
Well No.: LVH-6A No. 1
Sec. 35 TWP. 17N RGE. 8W

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one must start by looking at the definition of the term "Formation". It is, "A lithologic unit, recognizable in outcrop and of sufficient thickness to be represented by more than one line on a map of scale 1 inch equals ½ mile", the part about it being a "lithologic unit" is of particular interest in our discussion. The stratigraphy and nomenclature of the portion of section with which we are engaged is discussed in Louisiana Geological Bulletin # 29 on Webster Ph. by Martin, Hough, Raggio, and Sandberg, 1954. From their discourse it can be recognized that serious problems of correlation have arrizen through attempts to accomplish this by means of lithologies without continuous exposures. One point of agrement between them and me is that the top of the "Austin" is marked by the foraminifer Vaginulina regina. Note that this species occurs in well # 6A at 2920 but does not appear in well #17A. By correlation it should be at 2370 (550 ft. above its position in the other well). The electric log of well # 17A shows 380 ft. of lower Tokio sand and 6A shows 370 ft of that section. By either reconing the marker should have been encountered at approximately the same place and should have been present in both wells. Therefore we can think, probably correctly, that the point 2370± is equal to 2920 stratigraphically.

There may be several possible explanations for this discrepancy but the one which seems most reasonable to me is that the location of #17A was undergoing erosion at the time under discussion while the #6A location was receiving sediment of a marine nature. I would be rather amazed if further drilling, say 50± ft., would not produce the desired marker in the 17A well.

Let me conclude with a few remarks about nomenclature. It is certainly proper to use the local names for formations and this has been done in all but the case of "Austin". I can't help wondering why but perhaps it has been a custom of some long standing. Actually one should use Tokio for that portion of the section. Neither do I think it necessary for our work to use the Brownstown name for the shale between the Ozan and the Tokio unless one is particularly interested in the separation; these remarks go for the Buckrange and Blossom sands also.

In short, what has been called Austin in the company reports includes sand and shale deposits of the Tokio formation of the Austin group. My concept differs only in a reluctance to refer to beds as being Austin Age unles they have the Vaginulina regina present. This foraminifer does appear in a limey shale called the Ector tongue, perhaps what we have encountered in well 6A. What we may be looking at is a change of facies during late Austin Time creating such different conditions that the marker could not exist in this area. In truth no conflict in correlation merely one in nomenclature. The concept will help future inquiries.

Respectfully submitted,

Louis de A. Gimbrede

MV-9630.20

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COMPANY LAW ENGINEERING

LEASE NAME DOE LA POWER & LIGHT

WELL NO. LH-2A

SEC 3 TWP 18N RGE 10W

f.l. # 19

Louis de A. Gimbrede
Geological Consultant
Micropaleontology
Stratigraphy
Structure

117 Horseshoe Dr.
Lafayette, Louisiana 70503
Phone (318) 232-0537

April 18, 1980

To The Law Engineering Company:
A report on the micropaleontology of the cuttings from Well #LH-2A drilled in northern Louisiana.

The upper portion of the well has been worked and previously reported so this report will deal only with the portion below 1410 ft. The samples are all of poor quality. If they were caught on a "shale shaker" they might be better and certainly cleaner. It may be that a better sampling method would eliminate some of the"cavings" which contaminate the samples very badly. Also, if the mud were washed off the samples before sacking them it would make the job of weighing out a uniform quantity possible so there would be more control of abundance of the members of the faunas. Perhaps there will be a chance for me to watch this operation and make some helpfull suggestions at z not-too-distant-date.

However, with the material at hand and with improved washing procedures in the laboratory it has been possible to ascertain, with some degree of accuracy, the nature and age of the materials penetrated. An account of the contents and identity of the materials examined forms the bulk of this report.

The following log of the samples worked presents some of the signifficant features and the age determined from the fossils encountered:

1410-20 No slide. Ammobaculites midwayensis and Haplophragmoides sp. are the only Foraminifera observed. They are not particularly indicative of anything except that the sample is probably from some portion of the Midway formation of Paleocene age.

1440-50 Slide. Fine sand with lignite and brown quartzitic chips falling in from above, probably from Wilcox. There is a significant increase in the foraminiferal fauna indicating that somewhat more marine conditions existed during this time than during deposition of materials above. Genera noted: Robulus Dentalina, Eponides, Virgulina, Bolivina, & Cibicides, & Golbigerina. These are all dwarf and rare so indicate that conditions are better than above but not so good as below.

1470-80 Slide. The fauna in this sample is abundant in number of genera and species but not in number of specimens and all are smaller than normal size. Among those on the slide are: Bathysiphon, Clavulina, Robulus midwayensis, Dentalina, Vaginulina, Nodosaria, Polymorphina, Bulimina, Discorbis, Eponides, Cibicides, & Globigerina. These are all typical Midway forms and there is no evidence of anything earlier than this Paleocene age material.

1500-10 Slide. Same fauna as above but the specimens are larger and there is the addition of Nodosaria affinis, an important Midway species, The sediment is fossiliferous marl.

1530-40 Slide. Same fauna as above but the specimens are larger and more abundant. Also present are the typical Midway species: Vaginulina robusta & Truncatulina midwayensis plus the large Lituola sp.

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1560-70 Slide. Fauna as above except all are much larger and more abundant. The fossiliferous marl is the main lithology with only a small amount of sand and other things from above.

1590-1600 Slide. Lithology as above, no limestone. However, this is the first Cretaceous material we have found in these samples as it contains, in addition to the fauna listed above, two typical Foraminifera of the Cretaceous: Globotruncana arca and Gumbelina cf. G. costulata as well as a few specimens of Bullopera.

1600-10 Slide. Similar to above except that the Cretaceous forms are more abundant and there is added Ventilabrella eggeri which is also not known above Cretaceous sediments.

1620-30 Slide. First appearance of limestone chips. Fauna same as above but more abundant and probably more species are present.

1640-50 No. slide Fauna as above.

1660-70 Slide. Fauna as above.

1680-90 No slide. Same as above

1700-10 Slide. Fauna same as above but the presence of "Inoceramus prisms" is noted as a further addition to the Cretaceous fauna. Inoceramus is a genus of pelecypod which is not known above the Cretaceous; its shell is formed of aragonite and so disintegrates into small prisms.

1730-40

1760-70

1790-1800

1820-30 Slide. Same fauna as above

1840-50 Slide. Same fauna as above. Last sample.

Fauna is not listed for the lower samples since there is no evidence of an older Cretaceous formation having been penetrated. There are, too be sure, increases in numbers of specimens and perhaps a few new species.

What the lower portion of the well indicates regarding conditions near the end of Cretaceous time and the beginning of Tertiary time, is that the Cretaceous sea was being pushed off the land by large amounts of sediment so that the end result was the dying out of some species and perhaps a complete withdrawal for a time. As The Paleocene sea advanced we find marine deposits once again for a short time until a barred basin develops in which the black shale of the upper Midway, Portess Creek, was deposited and then, as the basin filled, the development of a delta system which we recognise as the Wilcox. This finally develops a swampland with large amounts of sand at the close of early Eocene, Wilcox, time.

MV-9630.20

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CASE NAME DOE LA POWER & LIGHT

WELL NO. LH-2A

SEC 3 TWP 18N RGE 10W

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f.b #19

COMPANY LAW ENGINEERING
LEASE NAME DOELA POWER & LIGHT
WELL NO. LH-2A
SEC 3 TWP 18N RGE 10W

May 6, 1980

SUBJECT: Report on Purpose of Visit by L. de A. Gimbrede to Office at Minden, Louisiana, May 4, 5, 6, & 7, 1980.

PURPOSE: Purpose was twofold; to inspect sampling operation at drilling site and to examine sidewall cores from well #2-A in order to refine or confirm the decisions previously made on the basis of cuttings.

Visit to drilling site was completely satisfactory, a good job of accurate collection was in progress. The routines followed were suitable to our purposes. See separate report on this visit for some suggestions. (attached)

Examination of Sidewall Cores agreed with decisions based on cuttings at every point. The following is a list of the critical cores and their contents:

SWC 750' Very sparse, fauna of brackisle water type. Probably in lower Wilcox.

SWC 900' Black shale, v. sparse fauna less lignite than above. Probably in upper Midway, Porters Creek.

SWC 940' Same as above, silty sand.

SWC 1400' Black shale sparse fauna. New to the assemblage is Globigerina and a few Rotalia sp. indicating more marine conditions. Probably top of Marine Midway section equivalent to Wills Point of Texas and Clayton of Alabama.

SWC 1550' Abundant Marine Midway fauna including the typical Midway form Vaginuilina robusta.

SWC 1600' Abundant upper Cretaceous fauna marked by Globotruncana arca a genus which does not exist in Post Cretaceous time.

SWC 1650' Fossiliferous crystaline limestone. No identifiable Foraminifera observed but fragments of Inoceramus shell are present.

SWC 1665' Silty micaceous sand Nacatoch.

SWC 1700' Same as above.

SWC 1825' Same as above.

Louis de A. Gimbrede

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IN FIELD DATA CHECK

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MV-9630.20

Hole Name: DOE/Continental Forest Industries LVH-6A

te: May 5, 1980 Elevation:

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LEASE NAME DOE LA POWER

WELL NO. LH-2A

Location: sec. 35
twp. 17N
rnge. 8W

Contractor: JIM

SEC 3 TWP 18N RGE 7W

fl # 19

Data Checked By: Geraldine Gimbrede Date: 5-5-80

Received By: Alison C. Simcox Date: 5-5-80

REMARKS: The visit to this operation was most enlightening and the entire crew most helpful in explaining their methods and reasons for their routine.

No fault could be found with any regular procedures and this observer was satisfied with the overall procedure. The question of over-muddy samples was explained as being due to winter operations when seives become clogged with ice and some instances of water shortage. I was told that neither would be a frequent problem.

Xc Irene Sk LH-7

Our suggestions included a request for a copy of their log of the well operation showing down time, trips, circulations, etc. It is thought that such would aid in interpreting the samples. Also, it is in our thinking that the sample should contain portions of each portion of the interval indicated by the depths. This could be accomplished by having a catch bucket large enough to contain some of all the cuttings of the interval and a mixture of this material included in the sack sent to the office. Such a mixture would prevent only the topmost beds of the interval being sent in for our observation.

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LEASE NAME DOE LA POWER & LIGHT

WELL NO. LH-2A

SEC 8 [illegible] 18N [illegible] 10W

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f.6 #19

March 25, 1980

Report on samples sent to L. A. Gimbrede

[illegible] Samples were all examined and contents and condition noted on exterior of envelope. Three slides were prepared showing foraminifera of the lower samples. Results tabulated below indicate significant observations.

Depth

170 - 180 Foraminifera indicate this to be in some portion of the Cane River formation of Lower Claiborne, Middle Eocene age. No slide was picked because the sample is in need of more washing in order that a more comprehensive assemblage of Foraminifera may be picked and mounted.

220 - 230 Black shale with Cyclammina sp. and a few other arrenaceous Foraminifera suggest that this is in the lower portion of the Cane River Fm.

470 - 480 Fine sand and carbon pieces plus marcasite and muscovite and a derth of Foraminifera indicate this to be in the upper portion of the Wilcox Fm. of Lower Eocene age.

Note: The interval between 230 and 470 may represent the equivalent of the Queen City, Reklaw, & Carrizo formations of Texas. We have no information on what materials would indicate this but the stratigraphic position looks about right for this equivalency.

1130 - 1140 Black shale with sparse arrenaceous fauna including: Haplophragmoides sp. and Ammobaculites of A. midwayensis. Slide of some of these forms picked and included with this report

1170 - 1180 Similar

1210 -1220 Similar.

Note; These three samples are represented by slides but they all need more washing so the slides can be more representative of the fauna. None of the forms represented here are typical of the Midway species and consequently it is suggested that these beds may be in the Lower Wilcox rather than in the true Porters Creek Fm. of the Upper Midway Group of Paleocene age. It is expected that further drilling will reveal the true position by the samples taken at greater depth.

Respectfully submitted,

Louis de A. Gimbrede

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A.6 #19

LAW ENGINEERING TESTING COMPANY
Job Name: GULF COAST SALT DOMES — LOUISIANA
Job Number: MV 9630.20
Lease Name: D.O.E. — CONT. CAN CO.
Well No: LRH-13-A
Sec. 1 TWP. 14N RGE. 6W

p. 1 of 1

Louis de A. Gimbrede

Geological Consultant

Micropaleontology
Stratigraphy
Structure

117 Horseshoe Dr.
Lafayette, Louisiana 70503
Phone (318) 232-0537

August 31, 1980

Paleontological report on Well # LRH 13-A, Sec. 1, Tp.14 N Rg.6 W

This well drilled to 1480 ft. furnished a very poor se of samples and consequently the paleontologic results are not clear cut and the points established are not considered to be representative of the exact depths of the formation tops. The results of the investigation are tabulated on the accompanying log and are here summarized with the significant Foraminifera and other markers listed as found.

The upper 60 feet were found to be soil and other unidentifiable clays.

60-70 Sample contained fine sand, sparse glauconite, and a rare fauna of no significance.

100-110 Cement

220-230 Cane River; top indicated by presence of Cyclammina cane-riverensis & sparse pellets of glauconite. The fact that below this level the fauna increases consistantly also indicates that the formation is truly entered at this point. The fauna is consistant with that described by Hussey in 1943.

280-290 Middle Cane River This is the first really abundant Cane River fauna in these samples and is of significance as the top of Hussey's "Middle C.R." section (1949). This formation continues downward with a varying amount of glauconite and fauna until the samples show a definite change at:

440-450 Wilcox: Indicated by sudden large amount of lignite and a marked drop in amount of glauconite and fauna. There is also sandstone with siderite and frequent pyrite which indicate that these sediments were deposited under reducing conditions characteristic of most of the Wilcox

Samples below this point were examined every 100 feet, at least, but no change in their constituents was noted, amounts of each varied but the materials were always the same. Glauconite was, strangely, commo n in all these samples but no indigenous fauna was observed; all the "forams" were abraded and gave the appearance of having been rolled around indicating that they came from up the hole and were therefore in the "cavings".

The lowest 100 feet were examined at 10ft intervals but no evidence of Midway Foraminifera was seen. There was some indication that the matrix material had changed to a grey clay but this is not considered sufficiently diagnostic for our purpose without accompanying recognized Paleocene Foraminifera.

Respectfully submitted,

Louis de A. Gimbrede

Louis de A. Gimbrede
Consulting Paleontologist

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June 28, 1980

Dr. Zeev Berger
Law Engineering Testing Company
Minden, Louisiana 71055

Dear Zeev:

Here is the report on the Pre Claiborne section of well 7A.

I found these samples interesting for several reasons. The good first: They reveal some more of the section - the lower (older) Midway - which had not formerly been observed, this is the Kincaid Fm of which we have not had proof in earlier examined wells. The presence of Polymorphina cushmani at 2230-40 is the indicator***correction, Pseudopolymorphina is the proper name for the genus. These beds are not the lowest possible Paleocene but are earlier than any previously seen in this area in the course of my work here. The top beds of the Cretaceous in this well do not provide any indication to me of their exact stratigraphic position because I find no especially significant Foraminifera. I do know that here, as in other work done by me in this area we do not have the very latest Cretaceous beds known in the Gulf Coast. I have seen forams in the Texas outcrop section of later date than anything I have seen in this work, later Cretaceous that is.
The bad is: there appears to be a large amount of caving in the samples from below the Cane River all the way to the top of the Cretaceous. This opinion is based on the fact that there is much glauconite throughout what must be the Wilcox (Wilcox top is at 1,000 ft above that). There is little or no fauna accompanying the glauconite except eroded Claiborne specimens and very few of them.

The top of the Midway is placed at 1650-60 on the basis of a few Ammobaculites midwayensis but I am sure the top of the shale is really at 1560 as the electric log indicates. These discrepancies belie the care with which the samples are collected as observed by me at my last visit so I have no way to account for such. I think the top of the Cretaceous, at 2270 is essentially correct. Unfortunately the SWC at 2250 showed nothing and should be rewashed from new material if any results are to be obtained.

My best wishes to everyone!

[redacted]

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A Report on the Stratigraphy of Well # LH-7A Of the Law Engineering Testing Co. located in the Arcadia Field of Bienville Ph, La.

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The appermost samples present a marine fauna in a glauconitic shaleconsidered to be lower Cook Mountain (referred to in some Louisiana reports as St. Maurice from a well known exposure near that old settlement).

0 - 110 Ft. Cook Mountain

110 - 760 Sparta This section is completely composed of non-marine, unfossiliferous sand

760 - 1000 Cane River This section shows a complete change in lithology from the above sand. Here the sediment is composed of dark brown shale with large amounts of glauconite and a good fauna of Cane River foraminifera

1000 - 1650 Wilcox These samples are composed of fine sand and lignite with pieces of very hard, almost quartzitic, sandstone of a dark brown to red color. There is no identifiable indigenous fauna but there are rare specimens which seem to be caving from the upper formations.

1650 - 1660 Porters Creek This sample has a very sparce fauna including specimens of Ammobaculites midwayensis in black-grey shale. It is here considered to be the uppermost beds of the upper Midway Grp., Porters Creek Fm., Paleocene Age. This sample is a bit below (approx. 100ft.) what appears to be the level of change of lithology. However, the contact between the Porters Creek and the Wilcox is always a gradational one and the fauna is always rare and spotty at the top of the Midway (Porters Creek)

f.l. #19
GULF COAST SALT DOME - LA.
MV-9630.20
COMPANY LAW ENGINEERING
LEASE NAME D.O.E. CONT. FOREST INS.
WELL NO. LH-7A NO. 1
SEC 5 TWP 17N RGE 5W

2220-2230 Kincaid lower Midway This sample contains Psuedopolymorphina cushmani among a strong early midway type foraminiferal fauna indicating that beds of early Paleocene age have been reached. These are not the earliest Paleocene existant in the Gulf Coast but these beds, I believe, are the earliest encountered in any examinations I have made in the present study.

2250 Side wall core contains the uppermost evidence of Cretaceous age material in this well. The evidence is very sparce but the sample is very small and contains much material from the upper formations including a dwarf fauna, very rare, which looks like Lower Eocene material. However, there are some rare Inoceramus shell fragments and some striated Gumbelinasto indicate the Cretaceous age of this core.

2270 S.W.C. Contains a very abundant Cretaceous fauna confirming the observations indicated above. There is much somewhat consolidated sand i this sample and it is therefore considered to be upper Nacatoch Sd.

Report on Well # LH 7A Continued

The section below the Nacatoch Sd. contains limestone at 2350 and sandstone at 2380. A shale, dark grey to black in color, tops at 2480 and continues downward to 2820 where a hard limestone is encountered below which at 2580 to the T.D. a limey shall is the lithology.

This lower section would indicate a gradual shallowing of the sea, areef, followed by a somewhat euxinic basin followed by oscillating shore conditions of copious sand sedimentation and a final time of little or no deposition as the sea finally retreated to a seaward position from our location.

Louis de A. Gimbrede

Louis de A. Gimbrede, Ph.D.
Consultant Paleontologist

f.l. #19

GULF COAST SALT DOME - LA.
MV-9630.20
COMPANY LAW ENGINEERING
LEASE NAME D.O.E. CONT. FOREST IND.
WELL NO. LH-7A NO. 1
SEC 5 TWP 17N RGE 5W

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NORTH LOUISIANA STUDY AREA

APPENDIX B-2

HEAVY MINERAL ANALYSES

APPENDIX B-3

CLAY MINERAL ANALYSES

APPENDIX B-4

GRAIN SIZE ANALYSES

Heavy mineral analyses, clay mineral analyses, and grain-size analyses were not undertaken for the five Area Characterization sites in the study area.

APPENDIX C

Ground Water

NORTH LOUISIANA STUDY AREA

APPENDIX C-1

AQUIFER FIELD TEST METHODS

The basic objective of ground-water studies in Louisiana is to determine the availability, occurrence, movement, and chemistry of ground water in the study area. Quantitative knowledge of aquifer characteristics such as storage, transmissivity, and hydraulic conductivity provides the basis on which the occurrence and movement of ground water are defined. By combining these characteristics with water level, water chemistry, and lithologic data, a description of the ground-water flow system can be made.

Eleven deep wells and five water-supply wells were drilled at five data-collection sites during the field investigations for Area Characterization in the North Louisiana Study Area (Table C-1.1). All hydrogeologic data-collection sites were laid out in a manner similar to that shown in Figure C-1.1. All deep wells were constructed similarly to that shown in Figure C-1.2.

Aquifer tests were run at each well at each site (Table C-1.2). Tests were performed by pumping a well at a constant rate for a specified time period and concurrently observing water-level changes. Water levels also were monitored for a period of time after pumping stopped. These drawdown and recovery data were analyzed for determination of transmissivity and hydraulic conductivity by using the modified Theis nonequilibrium formula and Theis recovery formula (Ferris and others, 1962).

Test results and evaluations are contained in well completion reports (LETCo, 1981a, b, c, d, e).

Prior to aquifer testing, all wells were developed to remove remnant drilling fluids from the formation around the borehole and any fine-grain material from around the well screen. Well development normally was completed after a period of from 12 to 24 hours. An initial-capacity test was then run to determine the discharge rates to be used for a 24-hour aquifer test.

In some tests, changing temperatures and salinities and the presence of gaseous hydrocarbons caused an inconsistent pattern of test results. In such cases, the values of the aquifer parameters derived from the tests have a level of uncertainty associated with them which is greater than normal. To reduce this uncertainty, the aquifer test data selected for analysis were those obtained during periods when temperature, salinity, and concentration of gas were stabilized. Results of the LETCo analyses are in accordance with regional trends of published data. This suggests that the assumptions are reasonable.

NORTH LOUISIANA STUDY AREA

APPENDIX C-1

TABLE C-1.1

AQUIFER TEST WELL CONSTRUCTION SUMMARY

SITE ID	WELL ID	GROUND SURFACE ELEVATION[1] (FEET)	CASING LENGTH (FEET)	NOMINAL CASING DIAMETER (INCHES)	APPROXIMATE ELEVATION[1] TOP OF SCREEN (FEET)	SCREEN LENGTH (FEET)	NOMINAL SCREEN DIAMETER (INCHES)	GEOLOGIC UNIT SCREENED
	A	199.57	1662.42	6	-1462.85	132.45	4	Nacatoch Formation
LH-2	B	198.90	658.64	6	-459.74	81.36	4	Wilcox Group
	WS	197.76	61.73	4	136.03	72.77	4	Terrace/ Sparta Formation
	A	325.57	1480.00	6	-1154.43	61.09	4	Wilcox Group
LH-7	B	326.27	943.20	6	-616.93	86.77	4	Wilcox Group
	WS	329.47	476.95	6	-147.48	82.95	4	Sparta Formation
	A	270.00	1994.30	6	-1724.30	28.70	4	Austin Formation
LH-17	B	269.72	1312.00	6	-1042.28	60.94	4	Nacatoch Formation
	WS	270.38	294.00	4	-23.62	134.48	4	Wilcox Group
	A	241.65	1046.58	6	-804.93	158.90	4	Wilcox Group
LRH-13	B	241.12	564.21	6	-323.09	97.76	4	Wilcox Group
	WS	238.18	78.04	4	-160.14	114.42	4	Sparta Formation
	A	223.16	2537.23	6	-2314.07	154.75	4	Austin Formation
LVH-6	B	224.64	1831.18	6	-1606.54	86.80	4	Nacatoch Formation
	C	224.92	908.96	6	-684.04	61.04	4	Wilcox Group
	WS	221.64	32.00	4	189.64	61.51	4	Sparta Formation

1. DATUM IS MEAN SEA LEVEL

T-1727-0

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LOUISIANA STUDY AREA
APPENDIX C-1
TABLE C-1.2
SUMMARY OF AQUIFER SYSTEM PROPERTIES IN THE LOUISIANA STUDY AREA

SITE NO.	WELL	DATE OF TEST	AQUIFER SCREENED	DEPTH TO WATER PRIOR TO PUMPING (FT.)	DEPTH TO WATER AT END OF TEST (FT.)	PUMPING RATE (FT^3/SEC)	MAXIMUM FLUID TEMPERATURE OF PUMP DISCHARGE (°C)	TRANSMISSIVITY (FT^2/DAY)	HYDRAULIC CONDUCTIVITY (FT/DAY)	METHOD OF ANALYSIS (DATA FROM ANALYSIS OF WATER LEVELS IN PUMPED WELL UNLESS OTHERWISE NOTED).
LH-2	2WS	MARCH 17-19 1980	TERRACE/ SPARTA FORMATION	15.67	16.34	9.1×10^{-2}	19.8	480	3.9	THEIS MODIFIED NON-EQUILIBRIUM
								480	3.9	JACOB RECOVERY
	2A	MARCH 24-26 1980	NACATOCH FORMATION	225.36	225.00	6.5×10^{-2}	38.0	120	1.0	THEIS MODIFIED NON-EQUILIBRIUM
								73	0.6	JACOB RECOVERY
	2B	MARCH 14-16 1980	WILCOX FORMATION	59.09	64.67	1.9×10^{-1}	25.1	230	2.8	THEIS MODIFIED NON-EQUILIBRIUM
								220	2.7	JACOB RECOVERY
LVH-6	6WS	JULY 29-31 1980	SPARTA FORMATION	39.46	39.54	1.2×10^{-1}	18.6	5000	90	THEIS MODIFIED NON-EQUILIBRIUM
								6000	100	JACOB RECOVERY
	6A	SEPT 3-7 1980	AUSTIN FORMATION	92.48	99.09	7.8×10^{-1}	42.6	210	1.4	JACOB RECOVERY
	6B	AUG 21-25 1980	NACATOCH FORMATION	118.02	131.46	1.1×10^{-2}	31.5	4.7	0.05	THEIS MODIFIED NON-EQUILIBRIUM
								6.0	0.07	JACOB RECOVERY
	6C	JULY 23-27 1980	LOWER WILCOX GROUP	42.18	43.25	1.8×10^{-1}	28.5	450	7.6	THEIS MODIFIED NON-EQUILIBRIUM
								450	7.6	JACOB RECOVERY
	7WS	MAY 28-30	SPARTA FORMATION	180.69	180.69	1.6×10^{-1}	22.2	2700	31	THEIS MODIFIED NON-EQUILIBRIUM

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LH-7	7WS	MAY 28-30 1980	SPARTA FORMATION	180.69	180.69	1.6×10^{-1}	22.2	2700	31	THEIS MODIFIED NON-EQUILIBRIUM
								6200	72	JACOB RECOVERY
	7A	MAY 11-13 1980	LOWER WILCOX FORMATION	72.88	102.00	3.6×10^{-2}	31.7	7.1	0.12	THEIS MODIFIED NON-EQUILIBRIUM
								6.3	0.11	JACOB RECOVERY
	7B	MAY 16-18 1980	CARIZZO FORMATION	152.20	155.92	1.7×10^{-1}	28.1	610	7.0	THEIS MODIFIED NON-EQUILIBRIUM
								610	7.0	JACOB RECOVERY
LRH-13	13WS	JUNE 24-27 1980	SPARTA FORMATION	41.40	41.47	8.9×10^{-2}	19.8	330	2.2	THEIS MODIFIED NON-EQUILIBRIUM
								240	1.6	JACOB RECOVERY
	13A	JULY 9-15 1980	LOWER WILCOX GROUP	74.95	77.41	8.0×10^{-2}	31.2	51	0.5	THEIS MODIFIED NON-EQUILIBRIUM
								53	0.5	JACOB RECOVERY
	13B	JUNE 19-21 1980	UPPER WILCOX GROUP	76.50	79.80	1.9×10^{-1}	25.5	740	7.7	THEIS MODIFIED NON-EQUILIBRIUM
								660	6.9	JACOB RECOVERY
LH-17	17WS	SEPT 9-16 1980	LOWER WILCOX GROUP	76.10	76.03	9.8×10^{-2}	22.6	500	3.0	THEIS MODIFIED NON-EQUILIBRIUM
								500	3.0	JACOB RECOVERY
	17A	OCT 20-22 1980	AUSTIN FORMATION	275.54	278.08	2.0×10^{-2}		DATA WAS NOT ANALYZED FOR HYDRAULIC CONDUCTIVITY DUE TO FLUCTUATIONS IN WATER LEVELS CAUSED BY "GAS PULSES"		
	17B	OCT 6-9 1980	NACATOCH FORMATION	4.74	17.95	7.8×10^{-3}	28.3	2.0	0.04	THEIS MODIFIED NON-EQUILIBRIUM
								1.5	0.03	JACOB RECOVERY

9D A

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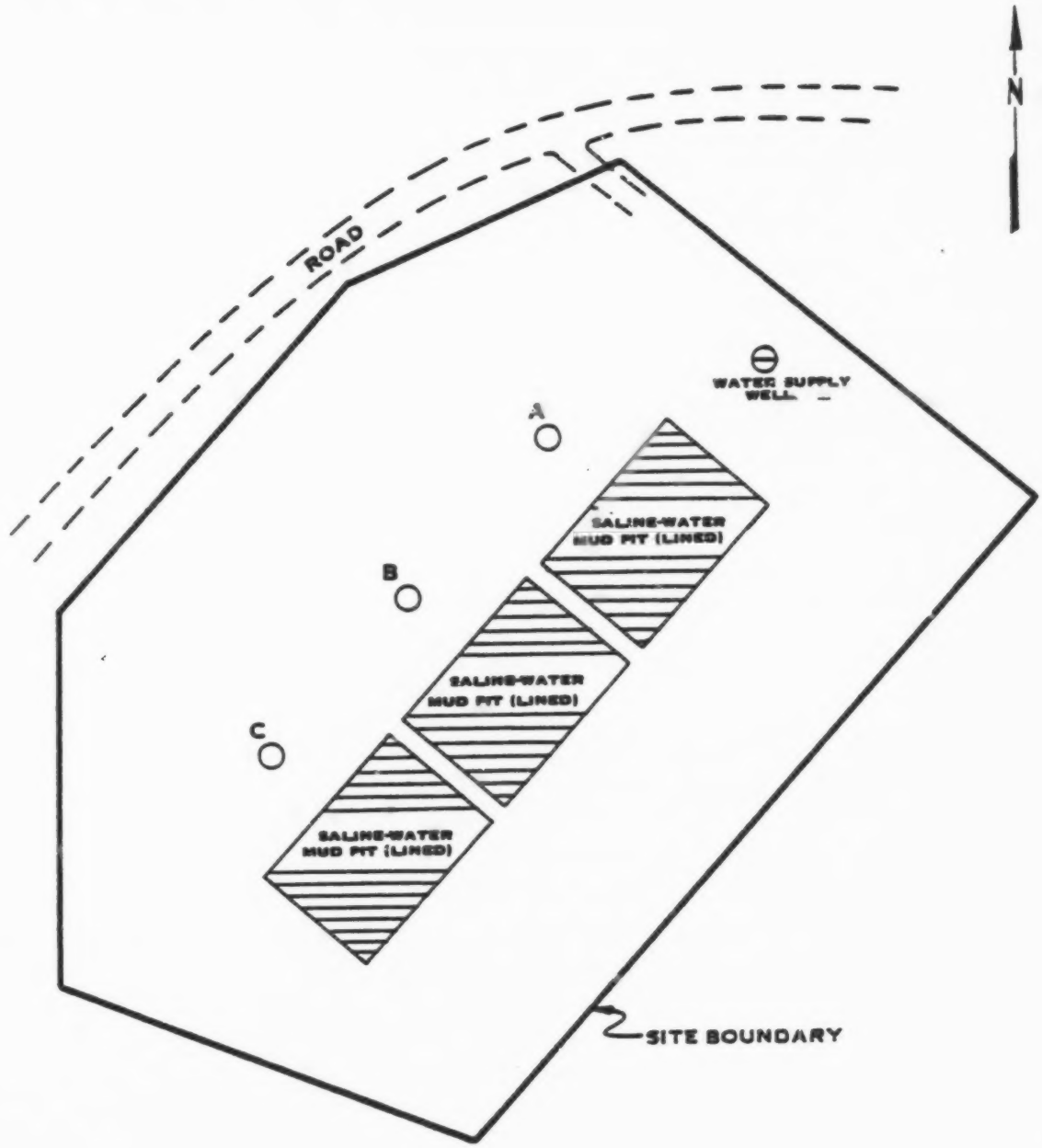

LEGEND

○ AREA CHARACTERIZATION WELL

100 0 100 FEET

20 0 20 METERS

PREPARED JNLE DATE 2/13/87	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA	NORTH LOUISIANA STUDY AREA APPENDIX C-1 TYPICAL DRILLING SITE LAYOUT
REVISED ____ DATE ____		
REVISED ____ DATE ____		
APPROVED GHF DATE 2/13/87		JOB NO. MV9700 FIGURE C-1 1
T-1185-2		

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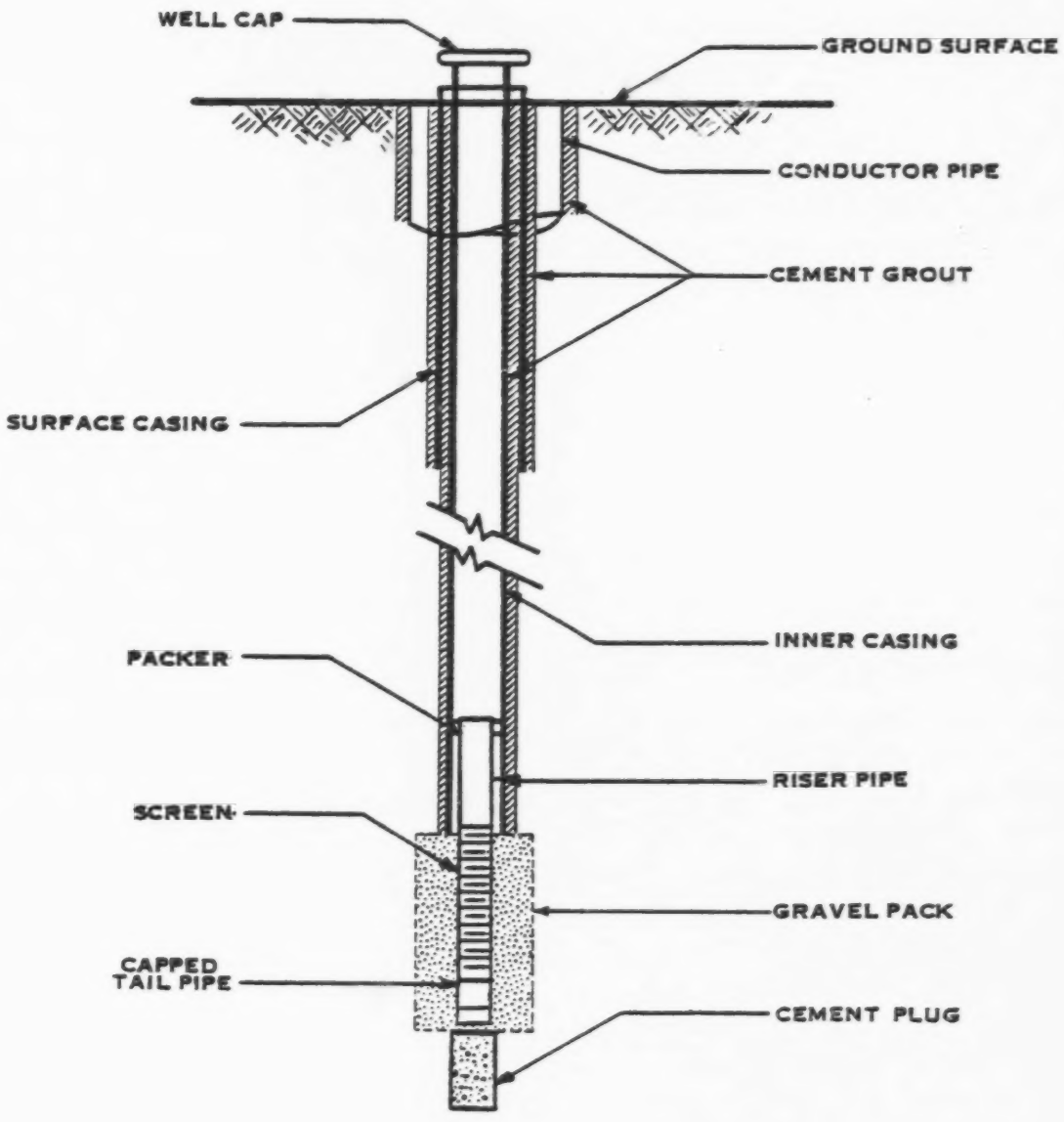

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PREPARED DNR DATE 2/13/81 REVISED ____ DATE ____ REVISED ____ DATE ____ APPROVED GHE DATE 2/13/81 T-1186-2	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA, GEORGIA	NORTH LOUISIANA STUDY AREA APPENDIX C-1 TYPICAL WELL CONSTRUCTION JOB NO. MV9700 FIGURE C-1.2

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APPENDIX C-1

REFERENCES

Ferris, J. G.; Knowles, D. B.; Brown, R. H.; and Stallman, R. W.; 1962, Theory of aquifer tests: U.S. Geological Survey Water-Supply Paper 1536-E, 174 p.

Law Engineering Testing Company, 1981a, Well completion report DOE-Louisiana Power and Light site LH-2: Law Engineering Testing Co., Marietta, Ga.

Law Engineering Testing Company, 1981b, Well completion report DOE-Continental Forest Industries site LVH-6: Law Engineering Testing Co., Marietta, Ga.

Law Engineering Testing Company, 1981c, Well completion report DOE-Continental Forest Industries site LH-7: Law Engineering Testing Co., Marietta, Ga.

Law Engineering Testing Company, 1981d, Well completion report DOE-Continental Forest Industries site LRH-13: Law Engineering Testing Co., Marietta, Ga.

Law Engineering Testing Company, 1981e, Well completion report DOE-Continental Forest Industries site LH-17: Law Engineering Testing Co., Marietta, Ga.

NORTH LOUISIANA STUDY AREA

APPENDIX C-2

WATER LEVEL MONITORING

Long-term water level readings are used to determine the response of the ground-water reservoir to recharge and discharge.

Water levels were measured periodically by LETCo personnel using a calibrated steel-tape. In some instances, hourly water-level measurements were recorded using Leupold & Stevens Digital Water Level Recorders. Tables C-2.1 through C-2.16 give basic data about each Area Characterization well and the measured elevations of the water level referenced to mean sea level.

NORTH LOUISIANA STUDY AREA

TABLE C-2.1

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL ENGINE AND PUMP CO. LH-2WS

WATER LEVEL MEASURED --- Screened in the Sparta/Terrace Formation (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 4.5-in.* steel casing, 1.53 feet** above the ground surface. Ground surface is 197.76 feet MSL.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
4/23/80	185.11	7/21/80	183.10	10/16/80	181.50
4/26/80	184.88	8/04/80	182.78	11/04/80	181.47
5/24/80	184.74	8/26/80	183.06	11/20/80	181.34
7/01/80	183.79	9/24/80	181.76	12/04/80	181.34
7/13/80	183.32	10/05/80	181.63	1/21/81	181.30
				2/25/81	181.49
				3/30/81	181.81
				6/11/81	182.18
				7/23/81	181.31
				9/11/81	180.97

T-1728-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.2

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LH-2A

WATER LEVEL MEASURED --- Screened in the Nacatoch Formation (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 1.62 feet** above the ground surface. Ground surface is 199.57 feet MSL.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
4/26/80	-18.02	7/21/80	-18.03	10/16/80	-18.02
5/24/80	-17.78	8/04/80	-17.91	11/04/80	-18.45
6/09/80	-16.79	8/26/80	-17.96	11/20/80	-18.24
7/01/80	-17.99	9/24/80	-18.11	12/04/80	-18.22
7/12/80	-18.07	10/05/80	-18.18	1/21/81	-18.27
				2/25/81	-18.14
				3/30/81	-17.92
				6/11/81	-18.17
				7/24/81	-17.52
				9/11/81	-18.61

T-1729-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.3

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LH-2B

WATER LEVEL MEASURED --- Screened in the Wilcox Group (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 1.21 feet** above the ground surface. Ground surface is 198.90 feet MSL.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
4/23/80	142.42	7/12/80	142.59	10/05/80	142.18
4/26/80	142.48	7/21/80	142.60	10/16/80	142.18
5/24/80	142.75	8/04/80	142.62	11/04/80	142.17
6/09/80	142.65	8/26/80	142.66	11/20/80	142.22
7/01/80	142.69	9/24/80	142.28	12/04/80	142.48
				1/21/81	142.81
				2/25/81	142.88
				3/30/81	143.04
				6/11/81	143.20
				7/24/81	142.78
				9/11/81	142.62

T-1730-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.4

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL ENGINE AND PUMP LVH-6WS

WATER LEVEL MEASURED --- Screened in the Sparta Formation (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 4.5-in.* steel casing, 1.84 feet** above the ground surface. Ground surface is 221.64 feet MSL. Hourly measurements recorded from 6/11/81 to present using a Leupold and Stevens Model 7001 Digital Water Level Recorder.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION
8/26/80	183.67	11/11/80	182.40
9/24/80	183.19	11/18/80	181.62
10/16/80	182.81	12/04/80	182.16
11/04/80	182.50	1/21/81	181.80
		2/25/81	181.66
		3/30/81	181.61
		4/24/81	181.58

T-1731-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.5

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LVH-6A

WATER LEVEL MEASURED --- Screened in the Austin Group (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 1.25 feet** above the ground surface. Ground surface is 223.16 feet MSL. Hourly measurements recorded from 6/11/81 to present using a Leupold and Stevens Model 7001 Digital Water Level Recorder.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION
9/24/80	126.61	11/12/80	126.82
10/16/80	126.88	11/18/80	126.82
11/04/80	126.82	12/04/80	127.00
11/11/80	126.84	1/21/81	127.01
		2/25/81	127.10
		3/30/81	127.29
		4/24/81	127.04

T-1732-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.6

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LVH-6B

WATER LEVEL MEASURED --- Screened in the Nacatoch Formation (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 0.80 feet** above the ground surface. Ground surface is 224.64 feet MSL. Hourly measurements recorded from 6/11/81 to present using a Leupold and Stevens Model 7001 Digital Water Level Recorder.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION
10/16/80	94.15	11/18/80	94.14
11/04/80	94.11	12/04/80	94.33
11/11/80	94.17	1/21/81	94.85
		2/25/81	94.74
		3/30/81	95.03
		4/24/81	94.90

T-1733-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.7

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LVH-6C

WATER LEVEL MEASURED --- Screened in the Wilcox Group (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 1.16 feet** above the ground surface. Ground surface is 224.92 feet MSL. Hourly measurements recorded from 6/11/81 to present using a Leupold and Stevens Model 7001 Digital Water Level Recorder.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION
8/04/80	183.88	11/11/80	184.11
8/26/80	183.97	11/12/80	184.09
9/24/80	184.06	11/18/80	184.15
10/16/80	184.11	12/04/80	184.29
11/04/80	184.10	1/21/81	184.34
		2/25/81	184.47
		3/30/81	184.71
		4/24/81	184.56

T-1734-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.8

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LH-7WS

WATER LEVEL MEASURED --- Screened in the Sparta Formation (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Hourly measurements recorded for the period 9/19/80 to 10/16/80 using a Leupold and Stevens Model 7001 Digital Water Level Recorder. Measuring point: top of locking cap welded to 6-in.* steel casing, 5.82 feet** above the ground surface. Ground surface is 329.47 feet MSL.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
6/30/80	151.00	8/26/80	150.94	11/20/80	149.73
7/12/80	150.75	9/19/80	149.65	12/01/80	150.07
7/21/80	150.70	10/16/80	149.55	12/04/80	148.79
8/04/80	151.05	11/04/80	148.89	1/22/81	147.68
				2/25/81	146.86
				3/30/81	146.51
				6/11/81	150.93
				7/24/81	148.66
				9/11/81	148.35

T-1735-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.9

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LH-7A

WATER LEVEL MEASURED --- Screened in the Wilcox Group (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measurement point: top of locking cap welded to 6-in.* steel casing, 1.49 feet** above the ground surface. Ground surface is 325.57 feet MSL. Hourly measurements recorded from 9/23/80 to 10/16/80 using a Leupold and Stevens Model 7001 Digital Water Level Recorder.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
5/15/80	250.30	6/30/80	258.57	9/23/80	254.24
5/16/80	253.57	7/12/80	258.11	10/16/80	252.96
5/17/80	254.99	7/21/80	257.76	11/04/80	251.92
5/27/80	258.87	8/04/80	257.06	11/20/80	251.07
5/30/80	259.06	8/26/80	257.15	12/04/80	250.39
6/09/80	259.04			1/22/81	247.76
				2/25/81	246.17
				3/30/81	244.71
				6/11/81	241.04
				7/24/81	238.73
				9/11/81	236.47

T-1736-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.10

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LH-7B

WATER LEVEL MEASURED --- Screened in the Wilcox Group (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 2.71 feet** above the ground surface. Ground surface is 326.27 feet MSL. Hourly measurements recorded from 9/19/80 to 10/16/80 using a Leupold and Stevens Model 7001 Digital Water Level Recorder.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
5/27/80	176.69	7/21/80	176.68	11/04/80	175.72
5/30/80	176.72	8/04/80	176.92	11/20/80	176.68
6/09/80	176.73	8/26/80	176.77	12/04/80	176.92
6/30/80	176.76	9/19/80	175.80	1/22/81	177.10
7/12/80	176.69	10/16/80	175.80	2/25/81	177.26
				3/30/81	177.58
				6/11/81	177.70
				7/24/81	177.29
				9/11/81	177.08

T-1737-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.11

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LRH-13WS

WATER LEVEL MEASURED --- Screened in the Sparta Formation (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: variable prior to 7/21/80. Measuring point as of 7/21/80: top of locking cap welded to top of 4.5-in.* steel casing, 2.59 feet** above the ground surface. Ground surface is 238.18 feet MSL. Hourly measurements recorded from 10/16/80 to the present using a Leupold and Stevens Model 7001 Digital Water Level Recorder.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
6/30/80	199.81	8/04/80	199.88	10/03/80	199.81
7/12/80	200.24	8/26/80	199.98	10/16/80	199.37
7/21/80	199.91	9/24/80	199.33	12/04/80	198.87
				1/22/81	198.43
				2/25/81	198.20
				3/31/81	197.96
				7/24/81	197.11
				9/11/81	196.75

T-1738-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.12

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LRH-13A

WATER LEVEL MEASURED --- Screened in the lower Wilcox Group (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 0.54 feet** above the ground surface. Ground surface is 241.65 feet MSL.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION
8/04/80	167.34	10/03/80	167.43
8/26/80	167.25	10/16/80	167.36
9/24/80	167.34	12/04/80	167.41
		1/22/81	167.30
		2/25/81	167.37
		3/31/81	*

* Obstruction at 71.78 ft.

T-1739-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.13

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LRH-13B

WATER LEVEL MEASURED --- Screened in the upper Wilcox Group (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 1.10 feet** above the ground surface. Ground surface is 241.12 feet MSL.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
6/25/80	164.56	8/04/80	165.73	10/16/80	165.61
6/30/80	165.01	8/26/80	165.60	12/04/80	165.90
7/12/80	165.50	9/24/80	165.59	1/22/81	165.73
7/21/80	165.30	10/03/80	165.63	2/25/81	165.80
				3/31/81	165.85
				6/11/81	165.62
				7/24/81	165.14
				9/11/81	165.04

T-1740-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.14

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LH-17WS

WATER LEVEL MEASURED --- Screened in the Wilcox Group (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 4.5-in.* steel casing, 0.71 feet** above the ground surface. Ground surface is 270.38 feet MSL.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION	DATE	ELEVATION
9/15/80	195.00	9/18/80	195.06	10/08/80	195.35
9/16/80	195.06	9/19/80	195.07	10/20/80	195.33
9/16/80	195.09	9/24/80	195.22	11/07/80	195.55
9/17/80	195.07	10/02/80	195.32	11/18/80	195.64
9/18/80	195.04	10/06/80	195.20	12/04/80	195.64
				1/22/81	195.76
				2/25/81	195.91
				3/30/81	196.15
				6/11/81	196.24
				7/24/81	196.08
				9/11/81	195.68

T-1741-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.15

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LH-17A

WATER LEVEL MEASURED --- Screened in the Austin Group (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 1.09 feet** above the ground surface. Ground surface is 270.00 feet MSL.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION
11/18/80	-9.41
12/04/80	-9.36
1/22/81	-9.55
2/25/81	-9.55
3/30/81	-9.46
6/11/81	-9.79
7/24/81	-10.30
9/11/81	-10.60

T-1742-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

TABLE C-2.16

WATER LEVEL MEASUREMENTS

WELL NAME --- DOE CONTINENTAL FOREST INDUSTRIES LH-17B

WATER LEVEL MEASURED --- Screened in the Nacatoch Formation (See Figure A-4.1 and Table C-1.1 for well location and well construction details).

MEASUREMENTS --- Periodic steel-tape measurements. Measuring point: top of locking cap welded to 6-in.* steel casing, 1.01 feet** above the ground surface. Ground surface is 269.72 feet MSL.

WATER LEVEL ELEVATION, IN FEET MSL

DATE	ELEVATION	DATE	ELEVATION
10/20/80	261.73	11/18/80	263.61
11/07/80	263.42	12/04/80	263.99
		1/22/81	264.32
		2/25/81	264.48
		3/30/81	264.71
		6/11/81	264.81
		7/24/81	264.47
		9/11/81	264.42

T-1743-1

*To convert to millimeters, multiply by 25.4.
**To convert to meters, multiply by 0.3048.

NORTH LOUISIANA STUDY AREA

APPENDIX C-3

WATER SAMPLING TECHNIQUES

Water samples were collected from wells during aquifer testing following procedures which included nitrogen-vacuum filtration. This method of sample collection is shown schematically in Figure C-3.1. Samples were placed in plastic containers that had been rinsed with acid and distilled water. Acid was added to the samples as appropriate for preservation. Samples to be analyzed for dissolved metals were filtered on site by using 0.45-micron filters and pressure filtration techniques.

The following list summarizes chemical parameters analyzed from the water samples.

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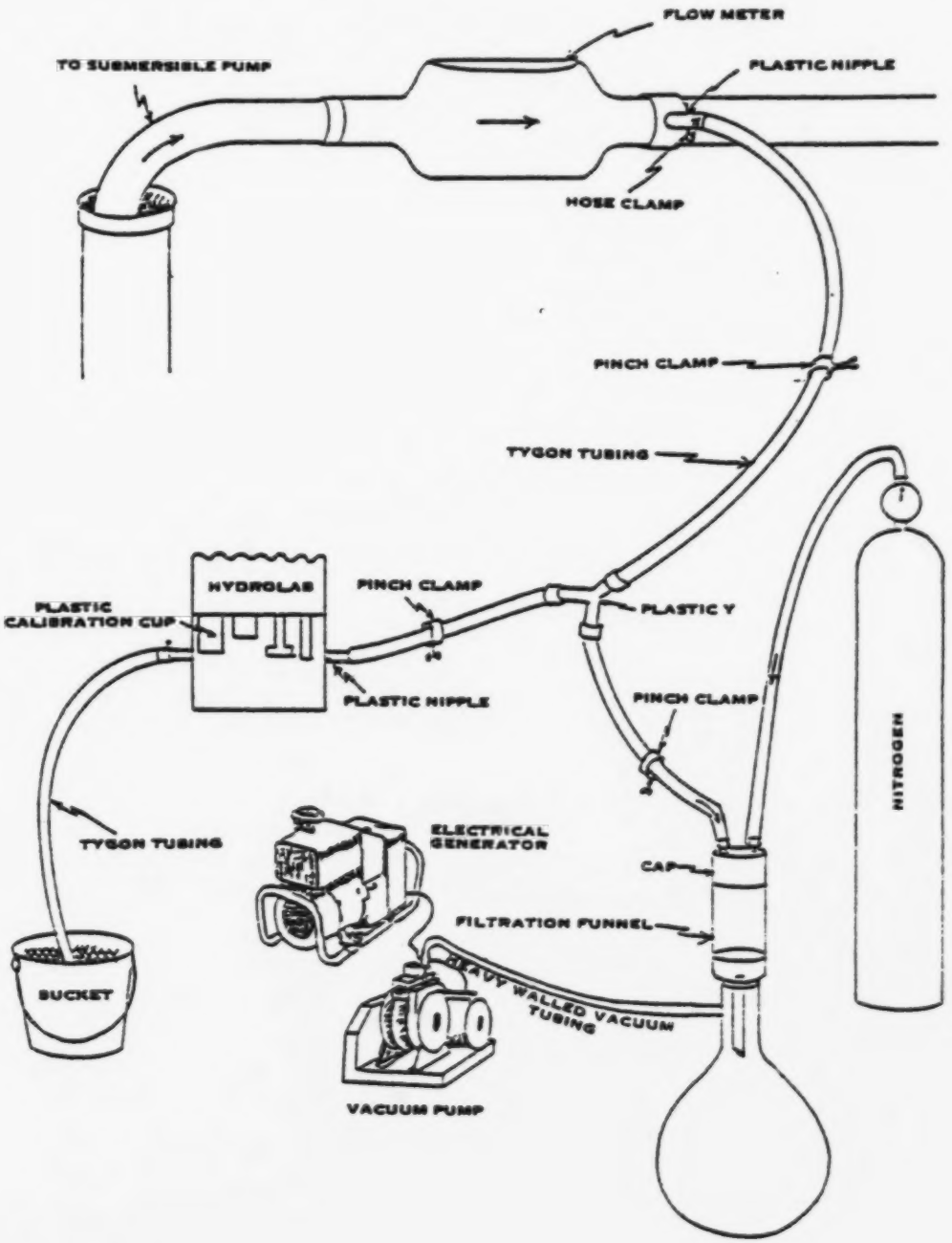

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PREPARED ____ DATE ____ REVISED ____ DATE ____ REVISED ____ DATE ____ APPROVED ____ DATE ____ T-1188-2	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA	NORTH LOUISIANA STUDY AREA APPENDIX C-3 INITIAL WATER QUALITY APPARATUS FOR SAMPLING UNDER ANAEROBIC CONDITIONS JOB NO. MV9700 FIGURE C-3.1

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CHEMICAL PARAMETERS

Aluminum, dissolved
Cadmium, dissolved
Copper, dissolved
Lithium, total
Zinc, dissolved
Strontium, dissolved
Boron
Nitrate
Sulfate
Sulfide
Iodide
Fluoride, dissolved
Calcium, total and dissolved
Iron, total and dissolved
Magnesium, total and dissolved
pH (standard units)
Manganese, total and dissolved
Potassium, total and dissolved
Sodium, total and dissolved
Chloride
Bromide
Selenium, dissolved
Vanadium, dissolved
Titanium, dissolved
Carbonate
Bicarbonate
Silica as Si02
Total dissolved solids
Density
Alkalinity
Hardness
Temperature (C)
Conductivity (umho/cm)

The methodologies employed in the analyses for these parameters are those described by Franson (1971) and the U.S. Environmental Protection Agency (1971). The results of chemical analyses, together with data obtained from USGS are summarized in Tables C-3.1 and C-3.2.

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SOUTH LOUISIANA STUDY AREA

APPENDIX C-3

TABLE C-3.1

SELECTED CHEMICAL ANALYSES OF REGIONAL GROUNDWATER FROM SPARTA SAND AND OVERLYING DEPOSITS
(Analyses reported in milligrams per liter except as noted.)

Site No.	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection	Temperature (°C)	Specific Conductance (micromhos)	Dissolved Oxygen	pH (s.u.)	Color (platinum-cobalt units)	Alkalinity (as CaCO3)	Hardness (as CaCO3)	Dissolved Calcium (as Ca)	Dissolved Magnesium (as Mg)	Dissolved Sodium (as Na)	Dissolved Potassium (as K)	Carbonate (as CO3)	Calculated Bicarbonate (as HCO3)	Dissolved Chloride (as Cl)	Dissolved Sulfate (as SO4)	Dissolved Fluoride (as F)	Dissolved Silica (as SiO2)	Dissolved Iron (as Fe)	Dissolved Manganese (as Mn)	Dissolved Nitrate (as N)	Dissolved Nitrite (as N)	Dissolved Ammonia (as N)	Dissolved Phosphate (as P)	Dissolved Solids (Residue at 180°C)
[illegible]	LO-260	312030-9513001	136 to 63	Sparta	01/17/69	18	30	-	6.1	<10	12	12	200	24	27	56	0	1.0	.30	2.5	2.0	<0.05	35	.00	.00	<0.02	<1.	<1.	.25
[illegible]	LO-261	312030-9513001	136 to 63	Sparta	03/10/69	20	30	-	7.2	<10	14	10	200	24	26	56	0	17	0.2	2.9	1.0	<0.05	31	.72	.03	<0.02	<1.	<1.	.26
[illegible]	64	320900-9533001	-	Upland Terrace	07/10/68	-	220	-	6.3	-	13	51	176	.3	32	55	0	12	5.1	1.0	13	-	30	130	-	7.2	-	-	.9
[illegible]	24a	321128-9530701	-	Sparta	09/27/74	20.0	111	-	5.7	-	06	12	124	19	6.3	56	0	6.2	.4	2.0	3.2	-	07	050	30	.0007	-	-	.1
[illegible]	24c	321000-9537302	-	Sparta	05/11/76	19.5	160	-	6.2	-	36	34	130	11	20	30	0	0.2	1.1	1.1	17	-	20	330	30	.1601	-	-	.1
[illegible]	4	320145-9530501	-	Upland Terrace	01/24/71	-	134	-	5.2	-	13	20	115	12	20	36	0	6.5	2.0	1.1	2.0	-	20	250	30	.5601	-	-	.0
[illegible]	24a	127/70-115400	-	Sparta	05/31/78	20.0	70	-	5.0	-	11	14	100* 10	9.0	9.7	14	0	3.0	1.5	2.2	5.6	-	16	130	5	1.001	-	-	.1
[illegible]	20	123510-9537001	-	Sparta	11/17/71	-	52	-	6.6	-	-	6	43	0.0	3.3	26	0	1.3	.2	1.9	.0	-	22	200	0	.08 .0003	-	-	.0
[illegible]	88	122505-9534903	-	Sparta	01/01/71	19.5	70	-	5.3	-	13	26	03	0.2	6.3	36	0	3.9	1.5	2.5	10	-	10	2300	150	.0001	-	-	.1
[illegible]	67	120030-9537002	-	Upland Terrace	08/22/78	-	90	-	5.5	-	10	10	00	11	14	22	0	6.5	1.6	1.5	2.0	-	00	100	50	2.303	-	-	.1
[illegible]	20	123625-9537301	-	Sparta	11/24/71	20.0	116	-	5.7	-	-	16	76	15	11	36	0	6.1	1.4	2.7	15	-	25	250	0	.07 2.303	-	-	.1
[illegible]	3300	120013-9534302	-	Sparta	07/22/68	19.5	51	-	6.9	-	13	-	70	0.0	5.5	36	0	2.0	.2	.5	5.0	-	32	500	-	.33 1.000	-	-	.0
[illegible]	26	123422-9536001	-	Sparta	05/10/78	20.0	27	-	6.4	-	7	6	100* 3	0.0	3.0	9	0	.3	.0	2.3	3.2	-	26	3000	30	.5305	-	-	.0
[illegible]	58	121421-9535102	-	Sparta	04/24/75	20.0	53	-	5.7	-	11	20	04	3.0	2.0	14	0	3.5	.5	3.1	6.2	-	22	250	0	-	-	-	.1
[illegible]	100	123134-9537101	-	Sparta	09/01/75	-	48	-	5.5	-	7	17	04	0.0	3.0	9	0	5.9	.0	3.3	16	-	25	202	40	.0303	-	-	.0
[illegible]	24	123347-9536501	-	Sparta	01/20/69	-	56	-	6.2	-	20	-	03	0.3	6.7	32	0	6.4	2.0	2.1	30	-	37	3500	50	-	-	-	.1
[illegible]	2246	120002-9534302	-	Sparta	02/04/67	-	61	-	5.2	-	20	-	03	11	4.0	26	0	2.5	.7	-	7.0	-	13	130	20	.00 .0000	-	-	.1
[illegible]	230	123156-9537401	-	Sparta	05/26/67	20.5	76	-	6.1	-	-	7	03	7.2	4.5	22	0	2.0	.5	2.0	1.0	-	22	7500	-	.3000	-	-	.0
[illegible]	230	123307-9534701	-	Sparta	08/20/66	21.0	07	-	6.3	-	22	13	50	6.0	3.7	27	0	2.7	1.2	2.2	.6	-	20	1	-	.00 .1000	-	-	.1
[illegible]	329	123138-9537701	-	Upland Terrace	05/01/75	-	72	-	7.1	-	11	30	50	6.5	4.0	16	0	3.2	.5	2.0	4.5	-	31	30	30	.0707	-	-	.0
[illegible]	201	123217-9534701	-	Sparta	02/27/67	20.0	62	-	5.0	-	-	12	30	5.1	3.7	25	0	3.9	1.2	4.7	.0	-	27	2300	-	.1000	-	-	.1
[illegible]	222	1.0P43-9534326	-	Sparta	06/17/66	-	40	-	5.7	-	9	-	32	5.7	5.2	11	0	1.3	.5	1.0	.2	-	25	2000	-	-	-	-	.1
[illegible]	202	123633-9534902	-	Sparta	01/01/71	20.0	40	-	5.3	-	-	10	34	3.0	4.5	9	0	2.3	1.1	1.4	1.2	-	23	220	10	.26 1.001	-	-	.1
[illegible]	44	123139-9534601	-	Sparta	12/07/70	20.0	32	-	6.0	-	-	7	00	2.5	2.0	0	0	1.7	.7	1.1	.0	-	12	50	0	-	-	-	.0
[illegible]	496	123050-9533301	-	Sparta	05/24/78	19.5	51	-	5.7	-	7	6	00	2.7	2.0	0	0	2.0	.3	1.5	1.4	-	16	30	10	1.301	-	-	.0
[illegible]	7	123130-9534204	-	Sparta	01/04/68	22.0	44	-	5.6	-	9	11	04	4.0	4.0	11	0	3.0	1.2	.7	6.5	-	22	300	-	.02 .1000	-	-	.1
[illegible]	277	120030-9540302	-	Sparta	11/16/67	-	25	-	5.3	-	-	5	02	2.1	2.5	6	0	1.0	.6	.7	.0	-	27	30	-	.1770	-	-	.0
[illegible]	27	123117-9534504	-	Sparta	01/27/70	21.5	41	-	6.9	-	-	9	01	3.5	3.7	13	0	2.7	.5	1.0	3.3	-	26	1500	60	-	-	-	.0
[illegible]	25	121530-9540102	-	Sparta	05/16/78	21.0	33	-	6.2	-	3	0	02* 00	2.0	5.0	4	0	2.0	1.0	1.3	.5	-	11	00	30	-	-	-	.0
[illegible]	600	123140-9533302	-	Sparta	10/00/70	21.0	61	-	6.0	-	-	15	00	2.1	3.9	12	0	3.0	1.3	.0	3.2	-	13	500	40	-	-	-	.0

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[redacted]

APPENDIX C-3

TABLE C-3.1

[redacted]
(Analyses reported in milligrams per liter except as noted.)

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BEST DOCUMENT AVAILABLE

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BEST DOCUMENT AVAILABLE

SELECTED CHEMICAL ANALYSES OF GROUNDWATER FROM
OTHER CLASS AND CHEMICAL REPORTS (continued)
(Analyses reported in milligrams per liter except as noted.)

Well Number	Well	Latitude Longitude	Geologic Source/Unit (Aquifer)	Aquifer	Date of Collection	Temperature (°F)	Specific Conductance (µmhos/cm)	Color	pH	Calcium, Dissolved (Ca)	Magnesium, Dissolved (Mg)	Sodium, Dissolved (Na)	Potassium, Dissolved (K)	Bicarbonate (HCO3)	Carbonate (CO3)	Alkalinity, Total (as CaCO3)	Sulfate, Dissolved (SO4)	Chloride, Dissolved (Cl)	Fluoride, Dissolved (F)	Silica, Dissolved (SiO2)	Nitrate (as N)	Nitrite (as N)	Ammonia (as N)	Total Dissolved Solids (Residue at 180°C)	Total Dissolved Solids (Sum of Constituents)	Hardness, Total (as CaCO3)	Hardness, Noncarbonate	Iron, Dissolved (Fe)	Manganese, Dissolved (Mn)	Boron, Dissolved (B)	Arsenic, Dissolved (As)
[illegible]	[illegible]	[illegible]	-	Red River Alluvium	06/07/76	20.0	560	-	7.0	-	200	110	220	40	0.2	354	0	14	26	1.0	10	-	17	1000	370	.0073	-	-	.7
[illegible]	[illegible]	[illegible]	-	Upland Terrace	10/14/77	-	670	-	7.5	-	190	100	214	28	20	206	0	47	15	1.1	0.0	-	16	0	0	3.071	-	-	.2
[illegible]	[illegible]	[illegible]	-	Sparta	07/07/60	-	422	-	7.5	-	-	141	262	31	0.0	186	0	48	10	0.6	51	-	10	290	80	1.100	-	-	.0
[illegible]	[illegible]	[illegible]	-	Sparta	05/10/66	21.0	287	-	6.0	-	36	16	230	13	11	95	0	16	0.9	2.1	11	-	17	13000	-	0.2 .060	-	-	.1
[illegible]	[illegible]	[illegible]	-	Cane Hammock	07/16/69	-	380	-	6.5	-	-	24	77	3.0	3.6	52	0	10	1.0	0.6	2.2	-	17	110	24	1.005	-	-	.0
[illegible]	[illegible]	[illegible]	-	Red River Alluvium	10/10/77	-	1040	-	7.0	-	404	100	1010	130	120	492	0	140	70	2.6	200	-	20	1400	1000	6.393	-	-	.3
[illegible]	[illegible]	[illegible]	-	Red River Alluvium	03/12/75	19.5	1300	-	7.2	-	400	100	790	200	60	537	0	62	60	3.1	130	-	27	1300	690	-	-	-	.5
[illegible]	[illegible]	[illegible]	-	Upland Terrace	11/16/71	-	264	-	6.7	-	83	18	223	31	32	306	0	36	11	2.1	5.2	-	27	760	300	-	-	-	.2
[illegible]	[illegible]	[illegible]	-	Sparta	01/30/60	-	320	-	7.2	-	-	105	204	25	5.0	160	0	30	0.8	2.0	0.1	-	24	2000		-	-	-	.2
[illegible]	[illegible]	[illegible]	-	Upland Terrace	06/02/70	-	300	-	6.6	-	-	100	220	14	10	76	0	12	0.6	1.2	6.0	-	15	4000	240	.02 .0000	-	-	.0
[illegible]	[illegible]	[illegible]	-	Cane Hammock	07/06/72	-	1000	-	7.3	-	-	-	1400	160	200	244	0	200	84	15	760	-	30	2400	600	.00	-	-	.1
[illegible]	[illegible]	[illegible]	-	Red River Alluvium	06/01/76	-	972	-	6.9	-	131	100	127	20	10	447	0	100	20	2.6	2.0	-	16	7100	2200	0.001	-	-	.3
[illegible]	[illegible]		-	Red River Alluvium	12/14/76	-	660	-	-	-	204	140	200	23	0.0	120	0	100	10	.6	22	-	16	540	1400	-	-	-	.5
[illegible]	[illegible]	[illegible]	-	Sparta	06/13/67	21.5	1230	-	7.6	-	270	142	760	104	36	330	0	22	14	3.4	272	-	17	640	-	.02 .0000	-	-	.1
[illegible]	[illegible]	[illegible]	-	Sparta	02/21/73	-	307	-	6.8	-	62	42	170	24	0.7	24	0	12	.0	3.1	24	-	10	7000	90	.00	-	-	.1
[illegible]	[illegible]	[illegible]	-	Sparta	05/20/63	-	80	-	6.2	-	-	12	72	10	4.3	30	0	3.0	1.3	3.0	11	-	17	1700	-	2.100	-	-	.1
[illegible]	[illegible]	[illegible]	-	Sparta	02/06/60	21.0	60	-	5.9	-	-	15	36	4.0	3.3	16	0	3.0	1.3	1.6	13	-	12	760	-	. 3.000	-	-	.1
[illegible]	[illegible]	[illegible]	-	Sparta	05/10/71	21	21	-	5.7	-	6	5	15	5.1	2.3	7	0	1.9	.1	2.0	6.2	-	24	170	100	-	-	-	.0
[illegible]	[illegible]	[illegible]	-	Red River Alluvium	10/12/77	-	1000	-	7.0	-	403	100	-	-	190	390	0	-	-	-	200	-	-	4000	700	-	-	-	-
[illegible]	[illegible]	[illegible]	-	Sparta	10/21/67	-	2100	-	6.0	-	-	125	-	400	84	354	0	34	9.7	7.7	0.3	-	11	-	-	6.000 .20	-	-	.2
[illegible]	[illegible]	[illegible]	-	Sparta	06/13/75	-	190	-	7.5	-	31	17	102	16	6.0	21	0	5.0	1.1	5.1	0.6	-	12	1300	90	-	-	-	.0
[illegible]	[illegible]	[illegible]	-	Sparta	07/10/60	19.0	60	-	6.0	-	20	6	70	11	4.3	32	0	2.6	.6	2.2	5.6	-	26	17	-	.0000	-	-	.1
[illegible]	[illegible]	[illegible]	-	Upland Terrace	10/06/75	-	66	-	5.3	-	8	6	47	2.2	0.2	30	0	2.0	.7	1.1	.2	-	12	0	0	0.005	-	-	.0
[illegible]	[illegible]	[illegible]	-	Sparta	03/01/66	-	51	-	7.5	-	11	6	70	7.2	3.0	45	0	1.3	0.7	2.4	.0	-	24	12000	30	.01 .0000	-	-	.0
[illegible]	[illegible]	[illegible]	-	Cane Hammock	11/13/67	-	117	-	6.1	-	-	26	117	14	11	62	0	6.0	2.4	1.0	0.0	-	53	2000	-	-	-	-	.1
[illegible]	[illegible]	[illegible]	-	Upland Terrace	11/20/72	-	172	-	7.1	-	40	16	110	9.0	6.6	90	0	15	6.9	1.4	0.3	-	23	-	-	-	-	-	.1
[illegible]	[illegible]	[illegible]	-	Sparta	02/20/69	-	121	-	6.0	-	41	12	100	9.5	3.0	58	0	8.7	3.5	4.3	14	-	21	1000	70	-	-	-	.1
[illegible]	[illegible]	[illegible]	-	Sparta	06/26/68	20.5	91	-	6.1	-	-	25	107	6.0	3.0	52	0	6.0	2.4	0.5	.2	-	52	1000	-	.0000	-	-	.1
[illegible]	[illegible]	[illegible]	-	Sparta	02/19/68	21.0	80	-	7.0	-	-	10	62	13	6.5	30	0	3.0	.6	3.1	3.2	-	10	1200	-	.0000	-	-	.0
[illegible]	[illegible]	[illegible]	-	Sparta	06/30/64	-	61	-	-	-	16	6	35	5.0	1.2	20	0	1.3	1.2	2.7	0	-	25	70000	60	.02 .0000	-	-	.0
[illegible]	[illegible]	[illegible]	-	Sparta	12/23/69	-	66	-	5.5	-	-	12	40	6.5	4.3	22	0	2.4	.8	5.2	2.4	-	21	2000	600	-	-	-	.0
[illegible]	[illegible]	[illegible]	-	Sparta	01/22/70	21.0	50	-	5.4	-	-	8	34	6.3	2.5	21	0	1.6	1.0	2.6	5.2	-	26	2000	70	-	-	-	.0
[illegible]	[illegible]	[illegible]	-	Sparta	01/11/67	-	200	-	7.1	-	-	-	-	20	6.6	147	0	21	6.1	3.2	10	-	13	400	-	-	-	-	.1
[illegible]	[illegible]	[illegible]	-	Red River Alluvium	05/13/76	-	1000	-	-	-	476	1300	2000	200	200	800	0	370	100	6.0	400	-	10	5000	1300	1.701	-	-	.1

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NORTH LOUISIANA STUDY AREA

APPENDIX C-3

TABLE C-3.1

SELECTED CHEMICAL ANALYSES OF REGIONAL GROUNDWATER FROM SPARTA SAND AND OVERLYING DEPOSITS (continued)
(Analyses reported in milligrams per liter except as noted.)

Data Source	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection	Temperature °C	Specific Conductance (micromhos)	Dissolved Oxygen	pH (s.u.)	Oxidation Reduction Potential (millivolts)	Alkalinity (as CaCO3)	Hardness (as CaCO3)	Dissolved Solids (residue at 180°C)	Sodium Dissolved (as Na)	Chloride Dissolved (as Cl)	Bicarbonate (as HCO3)	Carbonate (as CO3)	Calcium Dissolved (as Ca)	Magnesium Dissolved (as Mg)	Potassium Dissolved (as K)	Sulfate Dissolved (as SO4)	Sulfide Dissolved (as S)	Silica Dissolved (as SiO2)	Iron, Dissolved (ug/L as Fe)	Manganese Dissolved (ug/L as Mn)	Nitrogen, Nitrate Dissolved (as N)	Nitrite Dissolved (as N)	Bromide Dissolved (as Br)	Fluoride Dissolved (as F)
USGS	270	330500-0853130	-	Cockfield	11/29/62	24.0	.34500	-	7.3	-	-	965	21000	8400	13200	607	0	163	107	39	-	-	8.7	3100	600	-	-	-	1.2
USGS	50	322716-0911050	-	Cockfield	04/18/77	-	21000	-	-	-	303	1300	16000* 15400	4200	6300	360	0	1200	69	27	2700	-	34	330	200	-	-	-	.7
USGS	1410	321759-0844100	-	Sparta	07/29/66	-	211	-	6.9	-	38	-	<180 205*	48	58	46	0	4.8	26	9.0	25	-	17	2500	50	.10 .5400	-	-	.0
USGS	314	323737-0826700	-	Upland Terrace	07/08/74	-	360	-	6.4	-	37	92	274	36	62	45	0	30	9.0	3.2	5.2	-	50	30	300	.7300	-	-	.1
USGS	307	323617-0826300	-	Upland Terrace	11/14/73	-	280	-	-	-	37	69	206	35	60	45	0	11	5.2	1.3	5.6	-	53	1100	60	1.307	-	-	.1
USGS	78	320620-0823000	-	Upland Terrace	11/06/69	-	305	-	7.3	-	-	34	138	30	36	66	0	6.3	3.1	1.6	9.6	-	61	1000	100	- .0800	-	-	.1
USGS	5	321001-0758200	-	Sparta	01/27/60	-	68	-	5.7	-	6	7	36	7.0	7.5	7	0	2.1	0.6	2.0	4.0	-	11	1507	-	1.4 0.700	-	-	.1
USGS	167	321127-0823600	-	Sparta	10/26/67	-	1260	-	8.2	-	-	10	775	280	26	513	24	2.3	1.1	1.9	152	-	11	60	-	2.000	-	-	2.3
USGS	280	320100-0843100	-	Sparta	08/16/68	-	1350	-	7.3	-	-	3	689	274	226	207	0	.7	.1	.3	34	-	16	430	-	.0800	-	-	.2
USGS	55	320926-0758100	23.5	Cane River	08/26/76	23.5	1080	-	9.0	-	350	5	644	330	30	306	30	1.2	.5	2.0	130	-	12	150	-	.1997	-	-	.5
USGS	180	321003-0837800	-	Cockfield	11/15/67	-	660	-	7.0	-	-	10	360	160	4.0	286	0	4.0	1.0	3.0	13	-	9.9	190	-	.6800	-	-	.2
USGS	270	320612-0843200	-	Sparta	01/26/60	-	974	-	6.7	-	-	0	594	320	32	522	24	3.2	.0	1.0	.0	-	9.0	60	-	.0800	-	-	1.0
USGS	283	320000-0838100	-	Sparta	11/26/79	-	2030	-	-	-	364	1	581	220	160	251	2	.2	.1	1.4	6.0	-	12	30	0	.3703	-	-	.2
USGS	274	320012-0844100	-	Sparta	04/01/61	-	-	-	9.0	-	256	0	360	-	85	198	60	0.4	1.6	-	-	-	-	-	-	-	-	-	-
USGS	273	320700-0834300	-	Sparta	10/27/67	-	1050	-	9.0	-	280	3	577	230	280	335	14	.8	.2	.7	.0	-	13	120	-	.00	-	-	.3
USGS	275	320700-0835100	-	Cockfield	08/15/67	-	889	-	8.3	-	-	0	575	222	12	560	0	1.3	.7	1.1	.0	-	11	30	-	.0010	-	-	1.0
USGS	283	320005-0834400	-	Sparta	11/22/71	-	960	-	8.7	-	-	1	336	215	169	253	16	.2	.1	2.0	.0	-	12	90	30	.3973	-	-	.6
USGS	291	320024-0844000	22.0	Sparta	08/31/71	22.0	951	-	7.0	-	256	60	530	172	65	312	0	16	5.4	2.6	111	-	15	170	110	.00 .0973	-	-	.3
USGS	148	321748-0838100	-	Sparta	11/16/67	-	628	-	7.3	-	-	22	404	140	8.6	327	0	5.9	2.0	2.2	48	-	13	30	-	.3000	-	-	.7
USGS	134	321050-0840900	-	Sparta	11/15/67	-	610	-	7.6	-	-	0	395	140	13	250	0	1.6	1.0	.7	86	-	10	220	-	.6800	-	-	.6
USGS	176	324631-0842570	-	Sparta	08/24/65	-	683	-	7.2	-	-	10	375	143	25	362	0	1.6	1.5	1.6	.0	-	12	5107	87	.5002	-	-	.7
USGS	3699	320627-0830403	23.0	Sparta	03/20/68	23.0	586	-	8.6	-	-	2	362	165	11	307	5	.5	.2	.6	32	-	15	70	.6	.5000	-	-	.3
USGS	212	321058-0841800	-	Sparta	02/08/72	-	517	-	6.6	-	-	-	336	130	2.7	336	12	3.6	.9	1.3	1.8	-	9.5	1280	30	.80	-	-	.5
USGS	122	323025-0900300	22.0	Sparta	07/17/68	22.0	531	-	7.8	-	190	0	352	129	16	262	0	1.0	.1	1.3	71	-	12	70	-	.02 .5800	-	-	.3
USGS	149	321023-0842300	-	Sparta	03/20/68	-	552	-	-	-	-	1	330	130	6.2	399	0	.2	.1	1.2	6.0	-	11	50	-	2.300	-	-	.1
USGS	178	324227-0839100	24.0	Sparta	07/10/68	24.0	515	-	7.6	-	205	4	331	122	30	250	0	1.2	.2	.8	17	-	11	90	-	.50 1.700	-	-	.2
USGS	154	322000-0837700	25.5	Sparta	01/15/69	25.5	536	-	8.8	-	237	7	331	135	44	289	46	2.0	.0	.6	2.0	-	12	230	-	1.693	-	-	.3
USGS	219	324643-0843400	-	Sparta	12/11/73	-	600	-	9.4	-	282	-	365	150	16	330	0	1.3	.3	.0	8.3	-	15	170	0	.0997	-	-	.6
USGS	124	323943-0837300	-	Sparta	05/29/74	-	371	-	8.0	-	162	4	240	81	11	173	0	1.1	.3	1.4	25	-	14	270	0	.5973	-	-	.3
USGS	121	323925-0901300	23.0	Sparta	07/17/68	23.0	606	-	7.7	-	190	0	380	113	13	230	0	2.0	.2	1.3	65	-	8.0	1100	-	.02 .5800	-	-	.3
USGS	150	321240-0842300	-	Sparta	01/16/63	-	430	-	8.0	-	166	0	294	99	6.1	202	0	.0	.0	.6	44	-	9.4	1007	-	.17 1.200	-	-	.2

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[illegible] LOUISIANA STUDY AREA

APPENDIX C-3

TABLE C-3.1

SELECTED CHEMICAL ANALYSES OF REGIONAL GROUNDWATER FROM SPARTA SAND AND CHICKASAW REPORTED CONSTituents
(Analyses reported in milligrams per liter except as noted.)

Date Sampled	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection	Specific conductance (micromhos)	Dissolved solids (residue at 180°C)	Color	pH (s.u.)	Dissolved calcium (Ca)	Dissolved magnesium (Mg)	Dissolved sodium (Na)	Dissolved potassium (K)	Total alkalinity as CaCO3	Dissolved bicarbonate (HCO3)	Dissolved carbonate (CO3)	Dissolved chloride (Cl)	Dissolved sulfate (SO4)	Dissolved fluoride (F)	Dissolved silica (SiO2)	Dissolved iron (Fe)	Dissolved manganese (Mn)	Dissolved nitrate (NO3)	Dissolved nitrite (NO2)	Dissolved ammonia (NH3)	Dissolved phosphate (PO4)	Dissolved boron (B)	Dissolved barium (Ba)	Dissolved strontium (Sr)	Dissolved lithium (Li)	Dissolved arsenic (As)
[illegible]	354	324149-0930301	-	Sparta	05/04/67	26.0	675	-	7.1	-	-	2	207	169	20	330	0	.6	.1	.6	58	-	12	190	-	-	-	-	.0
[illegible]	364	321720-0932701	-	Sparta	01/10/73	-	660	-	-	-	207	0	264	130	12	330	0	.0	.0	.0	33	-	12	30	30	.0200	-	-	.0
[illegible]	1879	323025-0936301	-	Sparta	05/05/66	-	660	-	7.0	-	163	0	255	204	25	323	0	1.0	.0	.0	36	-	12	70	-	.00	-	-	.0
[illegible]	367	324437-0933601	-	Sparta	05/11/65	-	672	-	7.0	-	-	0	264	189	30	324	0	.0	.0	.0	.3	-	15	60	60	.0000	-	-	.0
[illegible]	239	322959-0930901	-	Sparta	11/30/73	-	699	-	9.0	-	222	-	283	95	36	350	0	1.0	.1	1.0	33	-	12	500	30	-	-	-	.0
[illegible]	1292	321940-0933400	-	Sparta	01/09/63	22.0	635	-	7.0	-	157	3	302	261	26	370	0	.0	.2	1.1	38	-	17	2000	-	.00	-	-	.0
[illegible]	163	320323-0941501	-	Sparta	04/14/75	-	619	-	6.7	-	172	0	302	90	30	310	0	.0	.0	.0	34	-	11	70	0	.0000	-	-	.0
[illegible]	364	321953-0934103	-	Sparta	05/08/70	-	320	-	6.9	-	120	14	239 mmhos	76	11	334	0	0.0	.5	-	31	-	-	300	0	1.000	-	-	.0
[illegible]	275	320244-0935401	-	Sparta	05/11/67	-	650	-	6.3	-	-	1	279	330	7.0	350	0	.4	.0	.0	30	-	13	30	-	.0000	-	-	.0
[illegible]	561	321825-0936001	-	Sparta	01/10/74	-	614	-	6.9	-	189	2	272	205	9.0	330	0	.5	.3	.0	28	-	13	160	30	-	-	-	.0
[illegible]	144	321350-0941702	-	Sparta	12/01/67	24.0	682	-	6.3	-	-	0	306	90	3.0	289	0	.0	.0	.7	36	-	14	430	-	.0000	-	-	.0
[illegible]	175	324128-0939201	-	Sparta	08/14/61	21.0	612	-	6.9	-	126	4	257	90	20	288	0	.0	1.0	1.3	31	-	12	1000	80	.07 .0000	-	-	.0
[illegible]	201	321956-0941501	-	Sparta	07/01/59	-	370	-	7.0	-	156	5	263	90	3.7	280	0	1.0	.0	1.3	32	-	10	440	30	-	.40	-	.1
[illegible]	133	321314-0942701	-	Sparta	11/06/63	-	399	-	7.0	-	127	3	263	60	7.1	335	0	1.0	.1	.0	30	-	15	1000	0	.33 .0000	-	-	.0
[illegible]	199	321759-0943301	-	Sparta	07/11/60	-	370	-	7.3	-	144	-	263	90	14	276	0	1.0	.1	1.0	32	-	17	600	-	.33 .0000	-	-	.1
[illegible]	231	320830-0940201	-	Sparta	10/17/70	-	611	-	-	-	170	-	302	90	6.0	370	0	33	6.3	6.3	35	-	15	30	300	.0000	-	-	.1
[illegible]	363	321004-0942301	-	Sparta	08/01/75	26.5	682	-	6.9	-	197	15	350	90	6.7	354	10	3.0	.0	.0	33	-	15	370	0	-	-	-	.0
[illegible]	369	321930-0943401	-	Sparta	08/05/73	-	386	-	6.7	-	102	2	250	91	5.4	333	0	.0	.0	1.1	30	-	13	-	-	.0000	-	-	.1
[illegible]	61	321647-0944001	-	Sparta	07/27/71	-	382	-	6.3	-	103	10	256	70	5.0	334	10	1.0	1.0	-	35	-	-	700	0	-	-	-	.0
[illegible]	131	320813-0938001	-	Sparta	10/26/67	22.0	600	-	6.6	-	-	2	254	160	7.3	309	0	.5	.1	.0	36	-	13	30	-	.0000	-	-	.1
[illegible]	151	321630-0942501	-	Sparta	07/22/60	-	376	-	7.0	-	140	0	261	89	10	301	0	.0	.0	.5	29	-	30	0	-	0.00	-	-	.1
[illegible]	196	321959-0939001	-	Sparta	11/12/60	23.5	387	-	6.7	-	166	2	267	96	16	302	11	.2	.0	.0	34	-	15	180	-	0.00	-	-	.0
[illegible]	198	320000-0938301	-	Sparta	10/30/65	23.0	611	-	6.1	-	-	1	246	55	20	367	3	.1	.0	.7	30	-	12	310	-	.0000	-	-	.1
[illegible]	78	320125-0933301	-	Red River Alluvium	05/14/75	-	2000	-	6.2	-	305	330	606	67	50	610	0	330	54	1.3	5.6	-	32	4700	1200	1.000	-	-	.0
[illegible]	626	320956-0935401	-	Red River Alluvium	11/13/75	-	930	-	7.3	-	445	430	502	60	23	546	0	56	50	1.6	63	-	23	10000	230	1.400	-	-	.1
[illegible]	75	321335-0938001	-	Red River Alluvium	01/26/75	30.0	511	-	7.1	-	305	300	543	37	23	613	0	130	42	1.3	7.5	-	31	4100	1200	-	-	-	.1
[illegible]	4016	320040-0931601	-	Red River Alluvium	12/14/75	-	2630	-	-	-	464	470	630	54	28	566	0	50	30	1.1	110	-	31	3400	300	.0000	-	-	.0
[illegible]	340	321135-0938501	-	Red River Alluvium	11/02/73	30.0	1300	-	6.8	-	614	600	670	74	30	760	0	350	76	1.4	60	-	26	6000	1200	.0000	-	-	.1
[illegible]	886	320130-0939301	-	Red River Alluvium	01/30/76	30.5	1200	-	6.6	-	531	560	700	62	31	667	0	330	63	1.2	150	-	30	12000	900	1.300	-	-	.1

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NORTH LOUISIANA STUDY AREA

APPENDIX C-3

TABLE C-3.1

SELECTED CHEMICAL ANALYSES OF REGIONAL GROUNDWATER FROM SPARTA SAND AND OVERLYING DEPOSITS (continued)
(Analyses reported in milligrams per liter except as noted.)

Data Source	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection	Temperature °C	Specific Conductance (micromhos)	Dissolved Oxygen	pH (s.u.)	Oxidation reduction potential (millivolts)	Alkalinity (as CaCO3)	Hardness (as CaCO3)	Dissolved Residue at 180°C	Sodium dissolved (as Na)	Chloride dissolved (as Cl)	Bicarbonate (as HCO3)	Carbonate (as CO3)	Calcium dissolved (as Ca)	Magnesium dissolved (as Mg)	Potassium dissolved (as K)	Sulfate dissolved (as SO4)	Sulfide dissolved (as S)	Silica dissolved (as SiO2)	Iron dissolved (ug/l as Fe)	Manganese dissolved (ug/l as Mn)	Nitrogen, Nitrate dissolved (as N)	Iodide dissolved (as I)	Bromide dissolved (as Br)	Fluoride dissolved (as F)
USGS	106	324000-92304202	-	Sparta	07/24/68	-	480	-	7.6	-	160	1	305	96	27	195	0	.2	.1	.3	30	-	13	60	-	.02 .1503	-	-	.3
USGS	175	323906-93093101	-	Sparta	01/14/75	-	372	-	8.3	-	150	7	344	85	11	183	0	1.0	.6	1.1	19	-	11	230	0	.1073	-	-	.1
USGS	207	321605-92374052	-	Cook Mountain	08/04/70	-	480	-	8.3	-	-	36	303	70	4.0	234	0	8.4	3.6	5.1	30	-	14	970	100	-	-	-	.2
USGS	214	320443-92423701	-	Sparta	03/11/72	23.5	395	-	8.6	-	-	-	241	88	22	203	1	.6	.2	6.5	6.2	-	16	130	10	.02 .1073	-	-	.2
USGS	199	323013-92442601	-	Sparta	08/13/68	25.5	340	-	7.1	-	-	5	241	73	7.9	126	0	3.6	1.3	2.0	55	-	45	250	30	.1073	-	-	.1
USGS	134	321640-92430802	-	Sparta	03/21/68	21.0	372	-	-	-	-	1	241	85	8.9	170	0	.6	.0	1.1	27	-	26	130	-	.1050	-	-	.1
USGS	308	323950-93245501	-	Sparta	05/23/74	20.0	350	-	6.8	-	140	82	240	50	33	180	0	22	6.6	1.5	1.0	-	30	2000	85	.0372	-	-	.2
USGS	152	321302-92444001	-	Sparta	03/22/68	-	360	-	7.9	-	146	2	234	85	7.8	178	0	6.0	.1	.9	30	-	17	60	-	.00	-	-	.1
USGS	215	324325-92450202	-	Sparta	11/21/72	22.0	316	-	8.5	-	130	-	231	73	6.4	170	0	1.3	4.8	.5	16	-	23	2100	0	.1073	-	-	.3
USGS	14C	323050-93025403	-	Sparta	01/05/69	22.0	341	-	7.6	-	140	0	230	83	5.4	181	0	.0	.0	1.0	24	-	17	460	60	.00	-	-	.5
USGS	202	323950-92443201	-	Sparta	06/26/68	-	323	-	7.1	-	-	22	221	63	3.8	161	0	7.1	1.0	2.7	20	-	15	200	60	-	-	-	.0
USGS	1300	322155-92413601	-	Sparta	03/23/68	21.0	332	-	7.5	-	134	0	220	79	5.2	163	0	.0	.0	.0	26	-	26	20	-	.02 .1000	-	-	.1
USGS	171	323138-93465301	-	Sparta	06/21/70	26.0	341	-	8.6	-	-	1	217	84	14	130	0	.1	.2	.0	15	-	30	90	30	.00	-	-	.2
USGS	132	321431-92413001	-	Sparta	10/24/63	21.0	320	-	7.5	-	130	5	217	75	7.6	150	0	.0	1.2	.9	30	-	21	-	-	.02 .1000	-	-	.3
USGS	208	323237-92383002	-	Sparta	06/04/71	-	335	-	-	-	-	14	216	74	6.9	173	0	6.6	.5	1.3	26	-	15	620	50	.02 .1073	-	-	.1
USGS	137	321916-92421101	-	Sparta	05/01/75	23.5	341	-	8.4	-	142	2	216	75	6.6	173	0	.6	.1	1.0	23	-	24	50	0	1.073	-	-	.0
USGS	139	322600-92404201	-	Sparta	03/22/68	23.0	350	-	7.7	-	-	1	212	82	6.6	186	0	.6	.0	.9	14	-	16	100	-	.10	-	-	.2
USGS	145	321434-92362301	-	Sparta	01/17/68	-	358	-	7.0	-	-	23	211	60	7.4	150	0	5.7	2.1	2.0	17	-	24	490	-	.1000	-	-	.1
USGS	165A	323144-92300301	-	Sparta	10/07/70	-	311	-	7.9	-	142	7	210	75	7.1	173	0	1.0	.6	1.6	13	-	25	190	50	-	-	-	.1
USGS	166	323143-92300501	-	Sparta	05/13/68	-	313	-	7.4	-	133	0	209	71	14	162	0	1.9	.0	1.1	14	-	27	480	-	.02 .1000	-	-	.3
USGS	665	322826-92534801	-	Sparta	01/17/68	-	352	-	7.7	-	-	60	209	54	8.6	155	0	11	3.0	4.5	21	-	15	2200	-	2.000	-	-	.0
USGS	210	323605-92353501	-	Sparta	06/11/71	-	302	-	7.8	-	-	-	204	76	3.1	144	0	.0	.0	.6	6.6	-	13	350	10	.04 .1073	-	-	.3
USGS	1548	321428-92402001	-	Sparta	11/13/69	23.5	290	-	7.8	-	-	0	204	66	5.2	149	0	.7	.5	1.6	30	-	32	80	20	-	-	-	.1
USGS	183	323147-92301901	-	Sparta	05/16/68	23.5	307	-	6.8	-	-	2	203	70	6.8	146	0	0.5	.2	.9	14	-	22	146	-	.000	-	-	-
USGS	250	323553-92141102	-	Sparta	01/02/70	23.5	333	-	7.8	-	-	15	202	68	6.4	160	0	5.5	.3	3.7	27	-	11	30	40	.1073	-	-	.2

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Data Source	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection	Temperature (°C)	Specific Conductance (micromhos)	Dissolved Oxygen	pH (s.u.)	Alkalinity (as CaCO3)	Alkalinity (as CaCO3)	Hardness (as CaCO3)	Dissolved Calcium (as Ca)	Dissolved Magnesium (as Mg)	Dissolved Sodium (as Na)	Potassium (as K)	Carbonate (as CO3)	Calcium (as Ca)	Magnesium (as Mg)	Sodium (as Na)	Potassium (as K)	Chloride (as Cl)	Sulfate (as SO4)	Fluoride (as F)	Dissolved Solids (Residue at 180°C)	Suspended Solids (mg/l as Sol.)	Dissolved Iron (as Fe)	Suspended Iron (as Fe)	Dissolved Manganese (as Mn)	Suspended Manganese (as Mn)	Fluoride (as F)
USGS	3	321420-0952900	-	Sparta	06/05/75	-	42	-	6.3	-	10	5	10	3.4	1.2	12	0	1.0	0.1	2.5	0.2	-	20	1100	00	.0073	-	-	.0
USGS	135	321914-0943000	-	Sparta	06/02/75	31.5	130	-	7.8	-	130	2	290	75	7.2	200	0	.0	.1	1.2	30	-	32	70	0	-	-	-	.0
USGS	174	321600-0942500	-	Sparta	01/07/60	-	275	-	7.6	-	-	5	360	90	6.7	132	0	1.2	.4	3.0	33	-	27	6300	107	.0010	-	-	.2
USGS	150	320632-0941001	-	Sparta	10/12/70	-	270	-	7.6	-	-	10	200	50	8.0	132	0	1.0	3.2	4.0	35	-	60	2000	50	-	-	-	.1
USGS	253	321614-0943120	-	Sparta	08/08/69	-	275	-	7.6	-	104	23	200	51	8.0	127	0	7.1	1.2	3.0	33	-	35	530	-	.02 .1000	-	-	.1
USGS	16	322120-0940540	-	Sparta	01/17/68	-	60	-	5.0	-	17	6	10	1.2	2.2	21	0	2.0	.2	-	-	-	27	640	-	.05 .2000	-	-	.0
USGS	211	323535-0939401	-	Sparta	06/11/71	-	200	-	8.2	-	-	-	190	71	10	104	0	.0	.0	.5	4.2	-	23	140	00	.02 .1073	-	-	.1
USGS	9	321115-0951301	-	Sparta	05/12/70	-	270	-	6.2	-	91	70	190	27	21	111	0	19	5.5	5.9	10	-	10	1100	130	.5473	-	-	.2
USGS	261	322000-0940701	-	Sparta	07/21/69	-	250	-	-	-	-	1	190	50	6.5	120	0	.0	.0	1.1	20	-	27	600	10	-	-	-	.1
USGS	300	324134-0944301	-	Sparta	07/08/74	32.5	227	-	6.7	-	95	30	100	65	6.0	115	0	5.0	1.7	1.0	0.4	-	10	500	70	.0073	-	-	.2
USGS	216	324325-0945030	-	Sparta	11/16/72	23.5	200	-	8.1	-	115	-	190	66	3.1	140	0	.0	.0	.7	22	-	27	340	0	.1073	-	-	.1
USGS	213	323630-0941001	-	Sparta	01/21/72	32.0	277	-	7.2	-	-	-	200	69	2.9	104	0	1.2	.2	1.2	30	-	20	930	50	.11 .1073	-	-	.1
USGS	209	323332-0943001	-	Sparta	05/20/71	-	201	-	7.9	-	-	1	190	69	12	109	0	.2	.1	1.7	0.4	-	26	300	30	.02 .1073	-	-	.1
USGS	257	321751-0944201	-	Sparta	07/14/75	-	203	-	7.0	-	-	30	190	65	11	112	0	5.0	3.5	2.0	17	-	14	1100	60	.1073	-	-	.1
USGS	262	323000-0945101	-	Sparta	07/10/64	-	273	-	7.5	-	122	57	200	60	7.0	140	0	11	5.1	3.1	25	-	20	2000	-	.02 .1000	-	-	.2
USGS	252	323710-0950402	-	Sparta	09/12/68	30.5	200	-	7.2	-	100	20	176	45	7.0	122	0	5.0	1.0	2.2	15	-	21	950	-	.00 .1000	-	-	.2
USGS	257	323553-0944101	-	Sparta	12/19/69	24.0	309	-	7.2	-	-	10	170	51	7.0	140	0	5.0	.0	2.0	.11	-	17	300	00	.05 .1073	-	-	.2
USGS	2100	323110-0936001	-	Sparta	09/10/71	-	210	-	7.2	-	05	-	173 calc	44	11	204	0	.0	.7	3.1	7.2	-	-	1200	00	-	-	-	.1
USGS	204	323159-0944402	-	Sparta	04/15/70	-	267	-	8.5	-	-	2	173	42	2.0	103	0	.0	.2	1.2	11	-	16	200	30	-	-	-	.2
USGS	127	323813-0957701	-	Sparta	10/30/74	23.5	213	-	6.9	-	04	10	172	35	3.1	102	0	6.1	.9	3.5	30	-	25	650	00	.2273	-	-	.2
USGS	260	323859-0937901	-	Sparta	12/17/79	21.0	306	-	6.2	-	104	20	172	65	5.0	120	0	0.3	2.0	3.0	0.0	-	26	1300	60	.1073	-	-	.2
USGS	136C	323832-0957201	-	Sparta	07/01/76	-	227	-	7.0	-	90	-	171	00	3.7	110	0	2.5	.4	1.9	23	-	22	50	0	-	-	-	.2
USGS	173C	323306-0939601	-	Sparta	06/21/79	25.5	230	-	7.0	-	97	1	184	50	11	110	0	.1	.2	1.2	0.4	-	10	000	-	.00	-	-	.2
USGS	191	323041-0934002	-	Sparta	05/10/67	24.5	262	-	8.0	-	-	3	183	65	5.0	132	0	1.0	.1	1.5	20	-	21	230	-	-	-	-	.1
USGS	204	323325-0938701	-	Sparta	06/24/70	23.5	211	-	8.0	-	-	20	180	60	6.9	120	0	6.1	1.2	3.7	0.4	-	12	000	70	-	-	-	.1
USGS	305	324205-0933601	-	Sparta	06/13/73	-	201	-	6.7	-	66	10	179	40	10	102	0	2.2	3.3	1.7	0.2	-	55	970	10	.2073	-	-	.2
USGS	195	323133-0936302	-	Sparta	12/27/67	25.0	261	-	6.1	-	-	0	170	61	7.7	136	0	.0	.0	.3	11	-	20	130	-	-	-	-	.1
USGS	192	323342-0936301	-	Sparta	01/01/67	31.5	251	-	7.5	-	-	3	177	60	6.3	141	0	1.0	.1	.7	0.4	-	20	1200	-	.3000	-	-	.1
USGS	204	323630-0934401	-	Sparta	01/27/71	-	76	-	6.4	-	-	12	70	0.0	1.7	27	0	3.2	1.0	1.2	0.0	-	25	200	0	1.073	-	-	.1
USGS	30	322110-0957201	-	Sparta	12/07/70	25.5	71	-	-	-	26	1	70	14	3.0	32	0	.3	.1	1.5	0.0	-	27	00	0	.1073	-	-	.1

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NORTH LOUISIANA STUDY AREA

APPENDIX C-1

TABLE C-1.1

SELECTED CHEMICAL ANALYSES OF REGIONAL GROUNDWATER FROM SPARTA SAND AND OVERLYING DEPOSITS (continued)
(Analyses reported in milligrams per liter except as noted.)

Data Source	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection	Temperature °C	Specific Conductance (micromhos)	Dissolved Oxygen	pH (s.u.)	Oxidation Reduction Potential (millivolts)	Alkalinity (as CaCO3)	Hardness (as CaCO3)	Dissolved Solids (residue at 180°C)	Sodium dissolved (as Na)	Chloride dissolved (as Cl)	Bicarbonate (as HCO3)	Carbonate (as CO3)	Calcium dissolved (as Ca)	Magnesium dissolved (as Mg)	Potassium dissolved (as K)	Sulfate dissolved (as SO4)	Nitrate dissolved (as N)	Silica dissolved (as SiO2)	Iron, dissolved (mg/l as Fe)	Manganese dissolved (mg/l as Mn)	Nitrogen, Nitrate dissolved (as N)	Iodide dissolved (as I)	Bromide dissolved (as Br)	Fluoride dissolved (as F)
USGS	42	323440-92540901	-	Sparta	08/06/70	-	292	-	7.9	-	-	39	188	57	3.2	167	0	8.2	2.1	2.9	10	-	14	30	-	-	-	-	.1
USGS	110	324826-93181602	-	Sparta	12/17/75	-	288	-	6.8	-	112	58	188	36	7.2	136	0	20	3.0	3.9	20	-	27	280	330	1093	-	-	.0
USGS	179	324130-92395101	-	Sparta	05/14/68	-	252	-	7.4	-	-	6	197	58	0.5	134	0	1.1	.3	1.5	16	-	41	280	-	-	-	-	.5
USGS	30	321301-92515301	20.5	Sparta	05/11/70	20.5	151	-	6.9	-	48	9	107* 133	32	4.6	86	0	3.1	.3	1.8	3.1	-	19	670	10	-	-	-	.1
USGS	217	323325-92382702	-	Sparta	08/13/75	24.0	235	-	7.5	-	98	-	185	48	8.2	119	0	4.0	.5	1.7	6.0	-	44	350	50	.0383	-	-	.2
USGS	197	323157-92393801	-	Sparta	12/31/68	-	295	-	7.2	-	98	6	184	47	8.8	110	0	2.4	.8	1.6	10	-	48	480	-	.33 1.483	-	-	.1
USGS	142C	321425-92410901	-	Sparta	07/22/68	-	269	-	7.6	-	112	3	184	62	7.0	136	0	1.0	.1	1.2	18	-	33	270	-	.00	-	-	.3
USGS	211	323342-92384201	-	-	08/05/67	23.5	250	-	8.0	-	110	2	169	63	8.5	145	0	.7	.1	.7	5.6	-	26	30	-	.00	-	-	.1
USGS	198	323406-92470801	-	Sparta	12/13/68	-	222	-	7.2	-	96	8	169	49	6.5	117	0	2.5	.6	3.7	14	-	32	300	-	.02 .0886	-	-	.1
USGS	203	323601-93144801	23.0	Sparta	05/05/71	23.0	230	-	7.5	-	103	23	169	44	6.9	126	0	6.0	.3	1.9	7.3	-	26	340	-	.0073	-	-	.1
USGS	201	323505-93145801	-	Sparta	06/27/71	21.5	247	-	7.3	-	106	36	169	49	7.0	129	0	11	2.1	3.7	12	-	12	580	-	.02 .0886	-	-	.2
USGS	205	323138-92503702	-	Sparta	06/01/70	20.0	169	-	5.9	-	74	2	168	39	7.1	90	0	.6	.1	1.0	1.9	-	53	380	0	.0473	-	-	.2
USGS	306	323630-93154102	-	Sparta	-	-	275	-	8.6	-	126	20	168	57	6.6	154	0	6.0	1.2	3.0	8.6	-	17	-	10	.1093	-	-	.1
USGS	294	323536-93173501	20.0	Sparta	09/25/68	20.0	246	-	7.6	-	100	12	168	54	7.0	122	0	6.6	.1	.6	12	-	32	660	-	.02 .0886	-	-	.1
USGS	173	323206-92471201	-	Sparta	06/14/68	-	150	-	7.1	-	87	10	167	45	9.2	106	0	3.5	.3	1.5	11	-	43	7600	-	-	-	-	.2
USGS	240	323850-93185401	-	Sparta	01/17/67	-	260	-	6.9	-	120	63	164	32	6.1	157	0	25	.1	3.5	7.6	-	17	1200	-	.02 .1083	-	-	.1
USGS	23	321103-92520401	20.0	Sparta	05/21/70	20.0	180	-	6.0	-	88	6	164	48	6.7	98	0	2.0	.3	1.5	6.0	-	50	280	40	.0383	-	-	.3
USGS	23b	321103-92515802	19.5	Sparta	05/11/70	19.5	158	-	6.3	-	72	16	161	39	6.5	88	0	6.2	.1	3.0	2.2	-	57	650	50	.0683	-	-	.3
USGS	140	323803-92450901	-	Sparta	06/24/66	-	163	-	7.4	-	58	28	150	26	6.3	71	0	9.8	.9	2.6	15	-	58	610	-	.08	-	-	.1
USGS	23b	321103-92515404	19.5	Sparta	05/10/70	19.5	151	-	5.9	-	60	7	150	32	6.4	84	0	2.0	.5	2.3	.6	-	53	680	50	.0683	-	-	.1
USGS	182	323803-92521601	-	Sparta	01/18/68	-	180	-	7.7	-	-	34	150	25	6.9	88	0	12	1.0	2.9	15	-	58	580	-	1.083	-	-	.1
USGS	33	322700-92505601	-	Sparta	07/07/69	-	150	-	7.0	-	-	12	155	28	7.2	84	0	3.7	.7	2.2	13	-	49	1400	50	.1383	-	-	.0
USGS	200	324247-93234501	21.5	Sparta	05/28/71	21.5	234	-	6.3	-	-	10	154	47	8.0	136	0	5.0	1.3	3.0	6.2	-	17	960	30	.02 .0973	-	-	.1
USGS	256	323646-93234301	20.0	Sparta	10/01/68	20.0	202	-	7.7	-	98	4	153	46	5.0	116	0	.9	.4	.8	5.6	-	37	340	-	.02 .0886	-	-	.1
USGS	187	323253-92424501	-	Sparta	06/13/68	-	185	-	7.8	-	62	11	151	34	6.9	76	0	2.6	1.1	2.5	12	-	51	1400	-	.00	-	-	.1
USGS	304	324205-93134602	-	Sparta	06/18/73	23.0	160	-	6.5	-	70	34	150	23	8.2	85	0	9.4	2.6	3.4	6.2	-	55	2660	-	.1093	-	-	.1
USGS	251	323719-93180401	20.0	Sparta	08/09/68	20.0	196	-	6.7	-	81	62	147	28	5.0	99	0	13	2.3	..7	10	-	38	2000	-	.02 .0883	-	-	.1
USGS	60C	321335-91395802	-	Red River Alluvium	12/14/70	-	1110	-	7.0	-	654	56	579	510	40	798	0	150	35	2.8	15	-	19	5600	370	4.383	-	-	.1
USGS	83	320810-91393801	20.1	Red River Alluvium	06/17/75	20.1	1610	-	6.5	-	560	720	1010	95	130	682	0	180	84	3.2	140	-	25	11000	440	1.473	-	-	.3
USGS	104	321445-91364201	-	Red River Alluvium	01/11/75	-	1720	-	7.1	-	5.20	680	1040	110	220	657	0	158	77	1.8	81	-	21	11000	490	.00	-	-	.3

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NORTH LOUISIANA STUDY AREA

APPENDIX C-3

TABLE C-3.1

SELECTED CHEMICAL ANALYSES OF REGIONAL GROUNDWATERS FROM SPARTA SAND AND OVERLYING DEPOSITS (continued)
(Analyses reported in milligrams per liter except as noted.)

Data Source	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection																										
USGS	3	[illegible]	-	Sparta	07/24/70	21.5	139	-	0.7	-	-	30	140	13	5.3	68	0	6.0	3.3	3.9	13	-	62	1000	30	.02	-	-	.1
USGS	1300	[illegible]	-	Sparta	07/13/70	-	172	-	0.7	-	60	5	144	26	4.5	75	0	2.0	.3	1.6	30	-	50	70	0	-	-	-	.2
USGS	671	[illegible]	-	Sparta	06/26/68	-	-	-	7.0	-	-	46	240	30	7.6	95	0	12	6.0	-	22	-	31	-	-	-	-	-	-
USGS	674	[illegible]	-	Sparta	07/02/68	-	-	-	7.5	-	-	48	142	18	5.0	65	0	11	3.0	-	12	-	41	-	-	-	-	-	-
USGS	264	[illegible]	-	Sparta	11/01/67	-	204	-	6.7	-	66	46	143	21	6.0	120	0	13	7.0	3.0	9.0	-	35	2000	-	.02	-	-	.1
USGS	678	[illegible]	-	Sparta	07/28/68	-	-	-	7.5	-	-	15	142	25	3.8	75	0	4.0	1.0	-	6.0	-	66	-	-	-	-	-	-
USGS	252	[illegible]	-	Sparta	08/10/68	10.0	150	-	6.7	-	76	29	140	20	7.0	87	0	9.5	1.0	3.0	15	-	36	1500	-	.02	-	-	.1
USGS	254	[illegible]	-	Sparta	11/14/67	-	160	-	6.7	-	-	3	130	25	5.0	83	0	.4	.0	1.1	5.0	-	41	70	-	.0400	-	-	.2
USGS	675	[illegible]	-	Sparta	07/18/68	-	-	-	7.6	-	-	30	139	20	6.0	96	0	8.0	2.0	-	12	-	61	-	-	-	-	-	-
USGS	681	[illegible]	-	Sparta	08/12/68	-	-	-	7.3	-	-	33	130	24	.0	99	0	6.0	2.0	-	7.0	-	66	-	-	-	-	-	-
USGS	676	[illegible]	-	Sparta	08/14/68	-	-	-	7.6	-	-	24	135	26	5.0	95	0	8.0	2.0	-	11	-	50	-	-	-	-	-	-
USGS	660	[illegible]	-	Sparta	08/16/68	-	180	-	7.6	-	58	6	135	41	6.0	112	0	8.6	.0	2.3	1.0	-	7.6	4000	-	.21	-	-	.3
USGS	260	[illegible]	-	Sparta	12/21/72	10.5	126	-	6.3	-	26	20	130	12	15	70	0	4.6	1.3	2.0	30	-	44	144	-	.5693	-	-	.0
USGS	264	[illegible]	-	Sparta	08/26/72	22.5	136	-	6.6	-	-	7	130	27	6.6	76	0	1.9	.5	1.0	.2	-	28	700	30	.02	-	-	.1
USGS	220	[illegible]	-	Sparta	06/13/68	-	170	-	7.1	-	47	-	130	20	13	97	0	5.0	1.0	1.2	13	-	31	350	-	2.5	-	-	.1
USGS	672	[illegible]	-	Sparta	08/12/68	-	-	-	7.7	-	-	13	130	32	5.0	97	0	6.0	1.0	-	7.0	-	53	-	-	-	-	-	-
USGS	265	[illegible]	-	Sparta	06/14/72	22.0	122	-	6.0	-	-	6	144	25	6.0	68	0	1.6	.5	2.2	2.6	-	35	500	20	.02	-	-	.1
USGS	677	[illegible]	-	Sparta	07/26/68	-	-	-	7.2	-	-	26	132	21	5.0	81	0	6.0	2.0	-	6.0	-	48	-	-	-	-	-	-
USGS	673	[illegible]	-	Sparta	06/21/68	-	-	-	7.6	-	-	23	140	26	5.0	30	0	6.0	1.0	-	7.0	-	36	-	-	-	-	-	-
USGS	670	[illegible]	-	Sparta	07/31/68	-	-	-	7.3	-	-	13	140	28	3.0	40	0	3.0	1.0	-	7.0	-	52	-	-	-	-	-	-
USGS	265	[illegible]	-	Sparta	06/21/68	30.0	204	-	6.6	-	-	2	197	23	6.0	56	0	.6	.1	.0	.4	-	20	260	-	.02	-	-	.0
USGS	666A	[illegible]	-	Sparta	08/26/68	26.5	207	-	7.2	-	-	17	200	24	6.3	68	0	6.7	1.3	3.7	5.0	-	46	80	-	-	-	-	.0
USGS	258	[illegible]	-	Sparta	06/27/68	-	222	-	6.6	-	62	11	93	26	5.0	56	0	2.0	1.0	1.1	13	-	38	2000	-	.02	-	-	.1
USGS	2300	[illegible]	-	Upland Terrace	07/17/68	21.0	96	-	7.3	-	29	-	90	11	30	33	0	6.0	1.2	1.3	6.0	-	33	2000	-	.00	-	-	.1
USGS	680	[illegible]		Sparta	08/06/68	-	-	-	6.7	-	-	26	87	12	6.0	46	0	7.0	2.0	-	7.0	-	31	-	-	-	-	-	-
USGS	302	[illegible]	-	Sparta	05/23/72	22.0	72	-	5.9	-	30	16	86	7.0	3.3	36	0	6.2	1.3	2.3	1.3	-	45	2000	130	.0073	-	-	.0
USGS	5	[illegible]	-	Sparta	06/05/68	23.0	75	-	5.0	-	21	15	86	6.3	6.0	35	0	3.0	1.0	6.0	7.0	-	35	1400	-	.1000	-	-	.1
LETCo	120-130	[illegible]	100 to 60	Sparta	06/24/80	10.0	100	1.1	5.3	57	33	30	100	4.4	3.4	33	0	7.3	1.0	3.6	15	<0.05	37	1700	30	0.02	<1.	<1.	<0.05
LETCo	120-130	[illegible]	100 to 60	Sparta	06/23/80	10.3	71	1.1	5.1	30	32	19	65	3.1	2.8	32	0	4.7	1.3	3.0	7	<0.05	32	1100	40	0.02	<1.	<1.	0.1
LETCo	60-70	[illegible]	-047 to -260	Sparta	05/30/80	21.0	260	0.4	6.3	<5	55	60	210	30	7.0	90	<1	21	3.4	6.7	30	<0.05	37	2.5	0.04	<.05	<1.0	<1.0	0.10
LETCo	60-70	[illegible]	-047 to -260	Sparta	05/30/80	22.1	230	0.4	6.1	<5	58	54	210	28	5.8	80	<1	17	2.5	4.5	23	<0.05	40	2.1	0.04	<.05	<1.0	<1.0	0.12
LETCo	140-160	[illegible]	-090 to -130	Sparta	07/30/80	10.3	30	2.0	6.0	<100	<1	1	36	5	2.0	<1	<1	6.2	0.6	2.7	3	<0.05	14	0.2	<.05	<.05	<1.0	<1.0	<.05
LETCo	140-160	[illegible]	-090 to -130	Sparta	07/30/80	10.3	30	2.0	6.0	<100	2	1	33	1	2.2	2	<1	6.4	0.6	1.9	3	<0.05	14	0.1	<.05	<.05	<1.0	<1.0	<.05

* = residue at 105°C

TI = nitrogen, total (as nitrate)

DI = nitrogen, dissolved (as nitrate)

LETCo = Louisiana

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NORTH LOUISIANA STUDY AREA

APPENDIX C-3

TABLE C-3.2

SELECTED CHEMICAL ANALYSES OF GROUNDWATER FROM REGIONAL HYDROGEOLOGIC INVESTIGATION
SITES IN ADJACENT AREAS USING THE SPARTA SAND
(Analyses reported in milligrams per liter except as noted.)

Data Source	Well	Well Identifier	Sample Interval (Ft. - MSL)	Aquifer	Date of Collection	Temperature (°F)	Specific Conductance (micromhos)	Dissolved Oxygen	pH (s.u.)	Oxidation Reduction Potential (millivolts)	Alkalinity (as CaCO3)	Hardness (as CaCO3)	Dissolved Solids (Residue at 180°C)	Sulfate (SO4)	Chloride (Cl)	Fluoride (F)	Carbonate (as CO3)	Calcium (Ca)	Magnesium (Mg)	Potassium (K)	Sodium (Na)	Aluminum (Al)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Boron (B)	Cadmium (Cd)
LSTA	LA-3a	32 15 30- 93 15 30	-1063 to -1095	Sparta	02/23/88	76.1	313	-	7.2	+85	145	2760	34000	18000	30000	145	0	660	204	44	<1.0	<0.05	14	2.4	.2	<0.02	10	100	.3
LSTA	LA-3b	32 15 30- 93 15 30	-1063 to -1095	Sparta	03/23/88	78.4	324	-	7.2	+17	132	2770	34000	18000	30000	132	0	660	230	44	<1.0	<0.05	15	3.2	.2	.03	9.0	104	.4
LSTA	LA-3c	32 15 30- 93 15 30	-900 to -941	Lower Wilcox	03/14/88	73.4	470	-	7.6	+134	265	151	3500	1300	1900	265	0	32	9.5	8.6	<1.0	<0.05	14	.2	.05	<0.02	11.0	15	.4
LSTA	LA-3d	32 15 30- 93 15 30	-900 to -941	Lower Wilcox	03/15/88	73.3	450	-	7.8	+88	261	151	3450	1300	1700	261	0	33	8.7	8.8	<1.0	<0.05	15	.2	.02	<0.02	11.0	14	.4
LSTA	LA-3e	32 15 30- 93 15 30	-917 to -721	Upper Wilcox	03/16/88	77.5	4650	.8	6.0	-198	995	55	2400	1000	819	995	0	6.2	1.8	7.0	<1.0	<0.05	12	.2	<0.02	<0.05	<1.0	6	5
LSTA	LA-3f	32 15 30- 93 15 30	-917 to -721	Upper Wilcox	03/17/88	77.7	4630	.6	7.9	-198	1040	55	2400	1040	811	1040	0	5.0	1.7	6.9	<1.0	<0.05	12	.1	<0.02	<0.05	<1.0	6	6
LSTA	LA-4a	32 15 30- 93 15 30	-1154 to -1195	Lower Wilcox	03/06/88	76	10700	.6	8.2	-234	512	90	5400	2500	2000	512	0	16	5.9	11	6.1	<0.05	12	.03	.05	<0.05	<1.0	15	2.3
LSTA	LA-4b	32 15 30- 93 15 30	-1154 to -1195	Lower Wilcox	03/07/88	76.8	12500	.6	7.8	-235	542	95	6700	3000	3690	542	0	22	8.8	11	.8	<0.05	13	.4	.05	.05	1.5	15	2.1
GSAS	259	32 24 30- 93 [illegible]	-	Wilcox	11/13/69	-	331	-	6.9	-	-	66	139	17	31	68	0	12	3.6	3.3	.0	-	32	12000	290	.1073	-	-	.1
GSAS	38a	32 [illegible] 93 [illegible]	-	Carrizo	05/23/70	76.0	340	-	6.9	-	-	56	72	66	3.2	36	0	3.3	1.3	2.3	.0	-	37	700	-	-	-	-	.0
GSAS	87	[illegible] 93 [illegible]	-	Wilcox	07/13/73	-	682	-	6.8	-	89	31	363	85	4.0	408	0	34	3.9	3.3	.9	-	64	4400	130	.1073	-	-	.3
GSAS	138	32 [illegible] 93 [illegible]	-	Wilcox	12/03/84	78.5	323	-	7.4	-	138	625	216	20	6.4	193	0	36	8.5	3.2	2.4	-	37	170	300	.02 .1073	-	-	.0
GSAS	684	32 [illegible] 93 [illegible]	-	Wilcox	07/24/68	76.0	311	-	7.3	-	108	77	197	44	5.1	208	0	23	6.7	2.3	3.3	-	14	130	-	.08	-	-	.0
GSAS	687	32 [illegible] 93 [illegible]	-	Wilcox	07/24/68	71.0	372	-	7.4	-	200	57	232	68	7.0	244	0	16	6.1	2.0	2.0	-	15	100	-	-	-	-	.0
GSAS	8	32 [illegible] 93 [illegible]	-	Wilcox	10/01/63	71.0	428	-	6.0	-	-	140	284	30	29	167	0	31	15	4.3	47	-	45	3900	0	-	-	-	.2
GSAS	439	32 [illegible] 93 [illegible]	-	Wilcox	11/16/73	-	1070	-	6.2	-	315	280	647	77	100	304	0	87	40	2.0	9.0	-	29	.0	360	-	-	-	.2
GSAS	37	32 [illegible] 93 [illegible]	-	Wilcox	08/13/70	-	284	-	-	-	143	100	203	21	4.1	174	0	33	6.1	3.0	3.0	-	36	200	150	.2673	-	-	.1
GSAS	148	32 [illegible] 93 [illegible]	-	Wilcox	08/22/71	71.5	445	-	-	-	187	150	230	40	20	240	.0	36	43	.0	2.0	-	28	330	42	-	-	-	.0
GSAS	89	32 [illegible] 93 [illegible]	-	Wilcox	08/20/73	76.0	322	-	7.1	-	150	150	5000+ 315	56	20	236	0	48	11	3.0	30	-	35	2000	60	.2373	-	-	.3
GSAS	56	32 [illegible] 93 [illegible]	-	Wilcox	12/23/74	75.5	460	-	6.9	-	164	130	320	46	26	196	0	42	7.1	4.3	20	-	34	1600	130	.21	-	-	1.0
GSAS	77	32 [illegible] 93 [illegible]	-	Wilcox	02/23/68	-	2600	-	7.0	-	106	12	-	380	360	598	12	4.0	.5	1.4	0	-	13	120	-	.08 .1073	-	-	2.4
GSAS	172	32 [illegible] 93 [illegible]	-	Wilcox	08/30/67	76.5	1000	-	6.4	-	444	10	-	425	340	538	12	3.2	.5	1.4	.6	-	13	270	-	.05 .1073	-	-	1.0
GSAS	66	32 [illegible] 93 [illegible]	-	Wilcox	04/12/77	76.0	7400	-	7.7	-	230	174	5000+ 3830	1700	2500	304	0	64	16	24	5.0	-	11	40	50	.0873	-	-	.3
GSAS	227	32 [illegible] 93 [illegible]	-	Wilcox	05/13/72	-	4700	-	-	-	-	-	2300	900	920	844	12	5.0	2.2	7.0	8.2	-	13	70	30	.06 .1073	-	-	2.6
GSAS	215	32 [illegible] 93 [illegible]	-	Wilcox	03/22/77	76.0	2070	-	6.8	-	158	68	1420+ 893	400	530	230	0	17	6.1	5.0	14	-	18	1600	60	.1073	-	-	.3
GSAS	234	32 [illegible] 93 [illegible]	-	Wilcox	03/16/72	71.0	4200	-	7.6	-	-	-	-	500	170	163	0	440	200	8.4	2600	-	47	30000	7400	.06 .2673	-	-	.1
GSAS	48	32 [illegible] 93 [illegible]	-	Wilcox	05/30/77	-	2250	-	7.3	-	467	250	1440	260	30	204	0	50	5.1	12	300	-	7.0	1700	-	.0273	-	-	.3
GSAS	1016	32 [illegible] 93 [illegible]	-	Carrizo	04/18/73	70.5	78	-	5.6	-	0	16	84	7.6	12	11	0	5.1	2.0	.6	7.8	-	24	600	20	.2673	-	-	.0
GSAS	244	32 [illegible] 93 [illegible]	-	Carrizo	04/15/68	71.0	1700	-	6.1	-	-	90	1101 GSAC	370	364	412	0	34	5.6	10	.0	-	12	1240	-	.2673	-	-	.9
GSAS	99	32 [illegible] 93 [illegible]	-	Wilcox	02/22/73	73.0	1040	-	8.0	-	424	0	900	250	260	452	12	1.0	.0	1.6	.0	-	13	60	0	.2673	-	-	.9
GSAS	366	32 [illegible] 93 [illegible]	-	Wilcox	10/16/73	-	1230	-	6.4	-	-	3	777	300	40	788	9	1.0	.1	6.0	.0	-	16	170	30	.13	-	-	2.2
GSAS	297	32 [illegible] 93 [illegible]	-	Carrizo	10/22/68	-	-	-	8.0	-	305	30	770 GSAC	260	130	284	43	13	7.2	3.5	-	-	-	-	-	-	-	-	.7

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NORTH LOUISIANA STUDY AREA

APPENDIX C-1

TABLE C-1.2

SELECTED CHEMICAL ANALYSES OF GROUNDWATER FROM REGIONAL HYDROLOGIC INVESTIGATION SITES IN AQUIFERS UNDERLYING THE SPARTA SAND
(Analyses reported in milligrams per liter except as noted.)

Data Source	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection	Temperature °C	Specific Conductance (micromhos)	Dissolved oxygen	pH (s.u.)	Oxidation Reduction Potential (millivolts)	Alkalinity (as CaCO3)	Hardness (as CaCO3)	Dissolved solids (residue at 180°C)	Sodium dissolved (as Na)	Chloride dissolved (as Cl)	Bicarbonate (as HCO3)	Carbonate (as CO3)	Calcium dissolved (as Ca)	Magnesium dissolved (as Mg)	Potassium dissolved (as K)	Sulfate dissolved (as SO4)	Fluoride dissolved (as F)	Silica dissolved (as SiO2)	Iron dissolved (ug/l as Fe)	Manganese dissolved (ug/l as Mn)	Nitrogen, nitrate dissolved (as N)	Iodide dissolved (as I)	Bromide dissolved (as Br)	Fluoride dissolved (as F)
USGS	42	320842-92582501	-	Wilcox	07/24/68	23.0	1220	-	8.4	-	331	5	703	300	4.0	647	12	1.6	.2	1.1	96 -	0.7	1200	-	.00	-	-	1.1
USGS	15	321520-9161501	-	Wilcox	03/24/64	21.0	1180	-	8.7	-	-	5	760	300	33	650	32	1.0	.6	1.3	17 -	13	360	-	.0403	-	-	1.0
USGS	17	320953-92582901	-	Wilcox	08/10/67	21.5	1190	-	8.5	-	-	5	733	300	15	595	24	1.9	.1	1.3	95 -	16	90	-	.4203	-	-	1.0
USGS	530	321330-93090601	-	Wilcox	06/13/74	24.0	1170	-	8.6	-	402	3	732	300	20	685	24	1.0	.1	1.9	3.0 -	11	30	-	.5403	-	-	1.0
USGS	508	321143-93091901	-	Wilcox	10/23/72	23.0	1120	-	8.8	-	-	1	693	280	30	593	20	.1	.2	3.4	.0 -	12	90	0	.04 .0203	-	-	1.0
USGS	80	321943-93132601	-	Wilcox	07/24/68	23.0	1160	-	7.7	-	463	88	685	276	102	564	0	2.5	.4	2.1	1.8 -	8.2	80	-	.02 .0103	-	-	.9
USGS	290	323136-93222501	-	Gerrits	05/16/70	-	-	-	8.6	-	290	18	662 CALC	250	103	304	24	9.2	9.6	2.3	- -	-	-	-	-	-	-	.8
USGS	148	321527-93105601	-	Wilcox	10/23/67	23.0	1070	-	8.7	-	593	3	674	277	8.3	687	48	1.0	.1	.7	.0 -	12	80	-	.00	-	-	1.2
USGS	85	321527-93105602	-	Wilcox	11/07/72	-	1050	-	8.6	-	382	4	657	270	8.9	655	27	1.0	.4	2.3	1.0 -	12	80	10	.4403	-	-	1.1
USGS	317	322711-93213601	-	Wilcox	02/13/75	21.0	1020	-	8.7	-	473	6	613	240	58	588	24	1.8	.6	1.9	.0 -	10	60	0	.3303	-	-	.8
USGS	248	323137-93223101	-	Carrizo	07/12/68	21.0	1060	-	7.6	-	-	17	603	240	139	412	0	4.8	1.2	1.7	4.4 -	10	360	-	.1803	-	-	.7
USGS	316	322736-93213101	-	Wilcox	02/07/75	21.5	987	-	8.7	-	456	6	562	210	21	501	27	1.8	.4	1.6	1.2 -	10	50	0	.7003	-	-	.5
USGS	408	320036-93173501	-	Wilcox	09/18/70	-	966	-	8.2	-	376	26	562	220	85	458	10	6.2	1.1	2.4	.0 -	12	50	30	.3303	-	-	1.2
USGS	53	321052-93182201	-	Wilcox	06/21/74	23.0	951	-	8.9	-	469	5	564	230	19	513	39	1.9	.1	1.6	2.2 -	11	90	-	.3903	-	-	.7
USGS	315	322736-93213101	-	Wilcox	02/17/75	-	907	-	7.5	-	362	33	538	190	71	441	0	7.6	3.4	3.9	.2 -	10	10	0	.1603	-	-	.7
USGS	206	322858-93185502	-	Wilcox	03/12/71	23.5	842	-	8.5	-	-	15	523	212	6.3	560	19	4.0	1.2	2.6	.6 -	12	120	190	.2003	-	-	1.4
USGS	47	321127-93100401	-	Wilcox	08/08/72	-	769	-	8.8	-	-	3	472	180	8.6	430	19	1.2	.0	1.8	.0 -	12	100	30	.06 .2603	-	-	.7
USGS	98	321625-93203901	-	Wilcox	03/26/75	21.0	783	-	7.2	-	379	150	464	120	62	360	0	36	15	1.3	16 -	21	310	50	.1003	-	-	.5
USGS	97	320143-93205401	-	Wilcox	03/30/71	21.0	809	-	7.5	-	234	35	461	160	110	285	0	16	3.6	4.2	.0 -	20	80	60	.4803	-	-	.3
USGS	321	322852-93141401	-	Carrizo	05/24/70	22.5	679	-	8.2	-	230	2	430* 380	120	4.7	300	1	.5	.3	1.4	3.5 -	12	90	0	-	-	-	.7
USGS	92	320530-93131501	-	Wilcox	10/26/72	-	697	-	8.3	-	-	1	436	170	23	392	9	.3	.0	1.6	.0 -	10	810	10	.06 .2703	-	-	.6
USGS	404	320310-93214701	-	Wilcox	07/08/75	20.0	773	-	7.3	-	263	74	430	130	80	296	0	40	7.1	1.4	3.6 -	24	280	60	.0603	-	-	.2
USGS	52A	321330-93090602	-	Wilcox	06/28/74	21.0	710	-	8.9	-	353	4	446	180	6.4	382	24	1.6	.1	1.2	17 -	14	60	-	.3103	-	-	.3
USGS	256	322853-93140901	-	Carrizo	02/11/69	-	689	-	8.3	-	371	6	434	180	10	438	12	1.6	.6	2.0	3.0 -	9.6	190	0	.00 .0803	-	-	1.3

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NORTH LOUISIANA STUDY AREA

APPENDIX C-1

TABLE C-1.2

SELECTED CHEMICAL ANALYSES OF GROUNDWATER FROM REGIONAL HYDROGEOLOGIC INVESTIGATION SITES IN ADJACENT UNDERLYING THE OUACHITA AREA
(Analyses reported in milligrams per liter except as noted.)

Data Source	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection	Temperature (°C)	Specific Conductance (micromhos)	Dissolved Oxygen	pH (s.u.)	Calcium (calcium carbonate)	Alkalinity (as CaCO3)	Hardness (as CaCO3)	Dissolved Calcium (as Ca)	Dissolved Magnesium (as Mg)	Dissolved Sodium (as Na)	Dissolved Potassium (as K)	Bicarbonate (as HCO3)	Carbonate (as CO3)	Chloride, Dissolved (as Cl)	Fluoride, Dissolved (as F)	Silica, Dissolved (as SiO2)	Sulfate, Dissolved (as SO4)	Residue on Evaporation, Dissolved (Tons per Ac-Ft)	Residue on Evaporation, Dissolved (mg/l)	Nitrate, Dissolved (as N)	Nitrite, Dissolved (as N)	Phosphate, Dissolved (as P)	Arsenic, Dissolved (as As)
USGS	287	323836-93185301	-	Wilcox	03/04/71	24.0	694	-	6.7	-	-	0	420	163	6.0	390	10	2.0	.7	1.8	.0	-	13	1060	110	.1573	-	-	.0
USGS	402	320207-93210501	-	Wilcox	06/23/75	19.5	706	-	7.3	-	335	130	304	95	60	373	0	17	14	1.8	.0	-	24	130	10	.0072	-	-	.1
USGS	119	322347-93193201	-	Wilcox	10/14/77	22.0	634	-	8.4	-	270	8	294	150	61	331	6	3.1	.7	2.4	1.0	-	12	0	20	.0092	-	-	.0
USGS	1079	323132-93192301	-	Wilcox	04/13/73	24.0	684	-	8.9	-	255	5	290	150	61	296	6	1.9	6.1	6.3	11	-	15	10	5	1.013	-	-	.5
USGS	66	321051-93182301	-	Wilcox	10/22/63	20.5	664	-	7.4	-	241	35	260	126	30	294	0	7.7	5.1	2.0	.40	-	13	402	102	.46	-	-	.5
USGS	86	320614-93130601	-	Wilcox	11/07/72	22.0	460	-	8.6	-	-	3	364	140	31	310	7	.6	.6	1.0	6.2	-	13	330	10	.01 .0073	-	-	.3
USGS	69	321033-93150701	-	Wilcox	04/03/64	20.5	10	-	8.0	-	270	8	240	134	6.4	313	8	1.6	1.1	2.6	2.6	-	12	1320	-	.01 .0060	-	-	.6
USGS	386	321600-93163901	-	Wilcox	06/05/70	23.0	534	-	8.6	-	-	20	344	128	5.0	333	17	5.0	1.0	2.7	.0	-	17	280	20	-	-	-	.0
USGS	90	320429-93222302	-	Wilcox	01/06/72	-	531	-	8.9	-	266	0	330	150	23	290	0	2.2	.6	2.5	1.6	-	12	10	0	- .0072	-	-	.7
USGS	74	321633-93180802	-	Wilcox	07/11/68	21.7	584	-	7.9	-	260	3	333	133	5.8	327	0	4.1	.9	1.0	5.4	-	9.6	80	-	.04 .0060	-	-	.3
USGS	406	320610-93235101	-	Wilcox	07/23/75	-	533	-	8.6	-	183	6	211	120	35	215	5	1.6	.9	1.3	.0	-	13	35	6	.0072	-	-	.1
USGS	67	321040-93175201	-	Wilcox	10/30/63	-	581	-	7.2	-	270	12	306	134	9.0	330	0	3.0	1.1	1.6	5.4	-	12	320	102	.02 .0060	-	-	.3
USGS	1966	323330-93252001	-	Wilcox	03/27/75	22.0	488	-	8.4	-	197	23	263	110	22	260	0	3.6	2.7	1.6	23	-	17	230	10	.0063	-	-	.2
USGS	311	323847-93135701	-	Wilcox	07/17/71	-	489	-	6.8	-	200	3	302	100	5.0	239	0	.3	.2	1.6	5.0	-	8.9	60	0	.0023	-	-	.3
USGS	403	320618-93163401	-	Wilcox	07/17/75	-	675	-	7.2	-	160	27	233	96	33	195	0	0.0	1.0	2.2	.0	-	21	384	20	.0323	-	-	.1
USGS	11	321933-93044601	-	Wilcox	08/13/64	22.0	675	-	7.5	-	220	0	284	123	5.4	315	0	2.0	.2	1.2	1.8	-	12	1320	-	.02 .0060	-	-	.2
USGS	260	323553-93133501	-	Wilcox	06/01/70	19.5	431	-	8.5	-	-	80	265	66	19	318	10	10	7.1	2.2	4.0	-	17	270	60	.0272	-	-	.2
USGS	443a	321000-93150301	-	Wilcox	09/09/67	25.5	456	-	8.4	-	-	2	225	103	5.2	242	15	.5	.2	.2	.0	-	15	210	-	.0150	-	-	.1
USGS	20	321615-93184301	-	Wilcox	10/10/79	-	372	-	-	-	181	0	233	88	6.2	231	0	2.2	.6	1.6	2.4	-	16	60	0	.0150	-	-	.2
USGS	63	321040-93183801	-	Wilcox	10/23/63	21.0	396	-	7.1	-	183	49	247	72	10	290	0	0.0	5.0	2.1	12	-	15	320	102	.04 .0060	-	-	.3
USGS	408	321010-93183901	-	Wilcox	10/30/79	-	359	-	-	-	180	76	225	33	8.1	250	0	12	5.1	2.5	.0	-	32	60	40	.0072	-	-	.1
USGS	104a	321006-93178201	-	Wilcox	03/30/73	22.0	392	-	8.5	-	158	15	231	80	22	193	0	7.6	6.0	2.6	15	-	15	110	10	.0092	-	-	.2
USGS	213	321725-93161501	-	Carrizo	10/17/74	22.0	260	-	8.5	-	167	3	220	73	6.0	170	0	.0	.2	2.7	2.0	-	12	160	0	.0072	-	-	.2
USGS	11a	321930-93162101	-	Wilcox	11/27/64	21.0	364	-	7.2	-	179	66	227	71	5.5	210	0	10	6.5	5.3	2.0	-	20	260	20	.02 .0060	-	-	.2
USGS	231	322045-93200301	-	Wilcox	11/07/69	-	369	-	7.4	-	-	-	225	71	9.5	223	0	20	5.0	2.4	1.0	-	17	60	100	.0150	-	-	.1
USGS	68	321041-93182901	-	Wilcox	04/08/64	-	368	-	7.8	-	182	36	223	71	7.0	222	0	10	5.0	2.4	.0	-	16	6150	-	.02 .0060	-	-	.0
USGS	42	321400-93201701	-	Wilcox	08/06/73	-	310	-	8.1	-	145	6	210	60	6.2	177	0	2.4	.0	1.2	2.0	-	21	150	10	.15 .0072	-	-	.2
USGS	31	320846-93191501	-	Wilcox	01/18/67	23.5	340	-	7.9	-	-	4	217	85	9.2	217	0	1.2	.2	.7	.2	-	13	60	-	- .0150	-	-	.2
USGS	40a	321943-93173702	-	Wilcox	06/29/68	-	340	-	7.9	-	-	02	215	53	5.1	222	0	17	6.0	2.2	2.2	-	20	70	-	.02	-	-	.2
USGS	76	321101-93223101	-	Wilcox	10/22/68	-	334	-	7.4	-	153	24	213	69	10	184	0	6.7	5.0	1.2	.2	-	29	1760	-	.02 .0060	-	-	.3
USGS	89	320933-93130401	-	Wilcox	01/06/71	-	333	-	8.0	-	154	20	212	58	12	188	0	6.9	.7	1.6	.6	-	24	430	40	.0072	-	-	.2

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SELECTED CHEMICAL ANALYSES OF GROUNDWATER FROM REGIONAL HYDROGEOLOGIC INVESTIGATION SITES IN AQUIFERS UNDERLYING THE SPARTA SAND
(Analyses reported in milligrams per liter except as noted.)

Data Source	Well	USGS Identifier	Sample Interval (Ft., MSL)	Aquifer	Date of Collection	Temperature °C	Specific Conductance (micromhos)	Dissolved Oxygen	pH (s.u.)	Oxidation-reduction potential (millivolts)	Alkalinity (as CaCO3)	Hardness (as CaCO3)	Dissolved Solids at 180°C	Sodium Dissolved (as Na)	Chloride dissolved (as Cl)	Bicarbonate (as HCO3)	Carbonate (as CO3)	Calcium dissolved (as Ca)	Magnesium dissolved (as Mg)	Potassium dissolved (as K)	Sulfate dissolved (as SO4)	Boride dissolved (as B)	Silica dissolved (as SiO2)	Iron, dissolved (ug/l as Fe)	Manganese dissolved (ug/l as Mn)	Nitrogen, Nitrate dissolved (as N)	Iodide dissolved (as I)	Bromide dissolved (as Br)	Fluoride dissolved (as F)
USGS	4478	321943-93173701	-	Wilcox	04/23/68	22.0	341	-	8.3	-	-	62	212	53	7.4	206	0	18	4.1	1.6	2.2	-	25	70	-	-	-	-	.1
USGS	72	320305-93201401	-	Wilcox	02/07/67	-	308	-	7.2	-	-	30	206	63	23	155	0	4.5	2.1	1.0	.6	-	30	420	-	.0003	-	-	.2
USGS	13	321832-93164701	-	Wilcox	06/03/65	21.5	330	-	6.8	-	161	34	203	55	9.2	196	0	14	4.6	1.8	.0	-	31	460	-	.00	-	-	.1
USGS	236	322731-93160301	-	Wilcox	09/26/63	23.8	308	-	7.0	-	-	9	155	66	10	176	0	2.1	.9	1.4	.0	-	11	440	0	.3003	-	-	.1
USGS	73	320305-93201402	-	Wilcox	08/13/68	-	304	-	7.1	-	121	34	189	54	22	148	0	9.2	2.7	.7	3.8	-	12	800	-	.02 .1003	-	-	.3
USGS	603	320300-95200701	-	Wilcox	06/23/75	20.5	265	-	6.8	-	115	34	180	45	13	140	0	8.8	3.4	6.7	2.0	-	36	1500	10	.0273	-	-	.2
USGS	448	323246-95040701	-	Carrizo	04/04/68	25.5	320	-	-	-	-	63	185	30	33	180	0	18	4.9	7.1	5.0	-	18	4500	-	.6803	-	-	.1
USGS	263	323331-93162101	-	Carrizo	08/29/70	21.5	370	-	7.7	-	-	4	184	66	7.0	168	0	1.4	.1	2.4	.0	-	25	350	10	.0073	-	-	.2
USGS	237	322730-93160302	-	Wilcox	07/11/68	23.0	305	-	8.1	-	146	9	182	75	9.2	178	0	1.9	1.0	3.3	4.2	-	9.7	190	-	.00 .0003	-	-	.1
USGS	260	322440-93183401	-	Wilcox	11/07/69	-	265	-	7.9	-	-	20	179	54	5.2	162	0	5.3	1.7	2.7	1.4	-	26	770	100	.0073	-	-	.2
USGS	267	323420-93234801	-	Wilcox	05/06/70	-	675	-	8.2	-	328	19	-	165	36	381	9	5.6	1.2	-	.0	-	-	90	0	-	-	-	.1
USGS	61	321420-93550001	-	Wilcox	08/23/77	24.0	191	-	6.3	-	66	40	102	26	16	80	0	9.0	4.3	2.3	13	-	48	7000	150	.9673	-	-	.2
USGS	261	322623-93164801	-	Wilcox	11/07/69	-	237	-	7.3	-	110	16	132	46	4.9	134	0	4.9	.9	2.7	4.4	-	11	1100	30	.0073	-	-	.2
USGS	250	323533-93213501	-	Wilcox	07/17/68	19.0	164	-	7.6	-	71	33	139	16	13	86	0	15	4.3	.9	2.2	-	36	-	-	.02 .1003	-	-	.1
USGS	68	320706-93125701	-	Wilcox	07/19/73	21.0	96	-	6.0	-	41	10	107	17	3.2	50	0	2.4	1.0	2.0	6.6	-	60	1500	70	.1003	-	-	.1
LETCo	LSU-13A	3213170-92562702	-905 to -974	Lower Wilcox	07/08/80	29.9	720	0.9	8.4	-56	250	17	440	300	54	230	18	7.8	0.4	2.8	22	<0.05	16	<50	<50	<0.05	<1.	<1.	0.3
LETCo	LSU-13A	3213170-92562702	-905 to -974	Lower Wilcox	07/09/80	30.3	720	0.4	8.2	-48.0	250	18	450	310	52	230	0	7.0	0.5	2.4	23	<0.05	15	70	<50	<0.05	<1.	<1.	0.3
LETCo	LSU-13B	3213170-92562703	-323 to -421	Upper Wilcox	06/19/80	25.3	640	0.8	8.2	-143	340	6.0	430	140	11	340	0	2.1	0.4	1.8	1	<0.05	14	1700	100	<0.05	<1.	<1.	0.2
LETCo	LSU-13B	3213170-92562703	-323 to -421	Upper Wilcox	06/19/80	25.2	630	0.5	8.2	-179	330	4.0	440	150	12	330	0	2.6	0.6	1.8	1	<0.05	14	2600	130	<0.01	<1.	<1.	0.2
LETCo	LSU-6A	3226570-93100302	-2314 to -2474	Austin	08/03/80	40.4	153500	0.6	6.8	-132	130	7130	124700	42300	69600	130	<1	1720	670	110	1.7	<0.05	7.1	6.8	1.01	.7	8.8	69	0.42
LETCo	LSU-6A	3226570-93100302	-2314 to -2474	Austin	08/04/80	42.5	94200	0.1	6.6	-130	130	7080	125600	43600	70300	130	<1	1880	680	110	<1.0	<0.05	9.3	6.1	1.01	.07	8.2	70	0.45
LETCo	LSU-6B	3226570-93100303	-1606 to -1693	Wacotech	08/21/80	26.6	383000	1.1	7.1	-235	33	4330	215000	81500	127000	33	<1	960	33.0	360	2200	<0.05	4.2	31	<.05	.15	1.3	36	0.10
LETCo	LSU-6B	3226570-93100303	-1606 to -1693	Wacotech	08/22/80	29.8	284000	1.2	7.0	-180	150	4380	218000	82600	130000	150	<1	1060	360	360	2310	<0.05	6.9	15	<.05	.11	6.0	37	0.36
LETCo	LSU-6C	3225030-93100204	-684 to -745	Lower Wilcox	07/23/80	28.6	7600	0.6	8.6	-170	410	40	3840	1420	2870	410	<1	9.0	3.5	7.6	<1.0	<0.05	11	0.1	<.05	<.05	<1.0	1.6	0.84
LETCo	LSU-6C	3225030-93100204	-684 to -745	Lower Wilcox	07/24/80	28.2	7700	0.3	8.4	-181	410	40	3860	1300	3080	410	<1	9.7	3.5	7.6	<1.0	<0.05	11	0.2	<.05	<.05	<1.0	1.9	0.86
LETCo	LSU-17MB	3218040-93202501	-24 to -158	Lower Wilcox	08/09/80	22.2	340	0.6	7.5	-55	170	96	230	52	7	170	<1	32	5.8	2.8	3.0	<0.05	22	0.4	0.07	<.05	<1.0	1.0	0.20
LETCo	LSU-17	3218040-93202501	-24 to -158	Lower Wilcox	08/10/80	22.4	330	0.6	7.6	-64	170	94	230	34	11	170	<1	13	4.3	2.6	2.4	<0.05	23	0.5	0.09	<.05	<1.0	<1.0	0.27
LETCo	LSU-17A	3218040-93202502	-1724 to -1753	Austin	10/20/80	28.8	65000	0.4	7.9	-285	110	2740	64100	15700	25700	110	<1	770	58	80	13	0.11	8.9	6.1	0.17	9.9	25	11	0.60
LETCo	LSU-17A	3218040-93202502	-1724 to -1753	Austin	10/21/80	33.5	66200	0.3	7.5	-233	130	3050	64600	15600	25900	130	<1	790	150	57	5.2	0.06	10	6.8	0.36	2.3	36	120	0.88
LETCo	LSU-17B	3218040-93202503	-1042 to -1103	Wacotech	10/06/80	24.2	45000	0.5	7.9	-150	120	1710	30100	9940	16400	120	<1	460	110	34	4.0	0.08	9.0	2.9	0.29	<.05	11	51	0.30
LETCo	LSU-17B	3218040-93202503	-1042 to -1103	Wacotech	10/07/80	20.1	43500	0.3	7.9	-218	110	1790	29300	10700	16700	110	<1	460	130	38	<1.0	0.08	9.8	5.8	0.21	<.05	12	31	0.71

* = residue at 105°C

T3 = nitrogen, total (as nitrate)

D3 = nitrogen, dissolved (as nitrate)

CALC = calculated

* = [illegible]

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T-1745-0

In order to observe any major differences in water chemistry between the initial and terminal phases of the aquifer test, water samples were collected in selected wells after 6 and 24 hours of pumping. Water from most wells underwent some chemical change during the period of the aquifer tests.

Field measurement of temperature, pH, conductivity, and oxidation-reduction potential was performed coincidentally with aquifer testing. A Hydrolab 8000 system was used to measure these parameters. All instruments were calibrated according to manufacturers' specifications and at time intervals adequate to assure proper field function.

APPENDIX C-3

REFERENCES

Franson, Mary A., ed., 1971, Standard methods for the examination of water and wastewater, 13th edition: American Public Health Association, Washington, D.C.

U.S. Environmental Protection Agency, 1971, Methods for chemical analysis of water and wastes: U.S. Environmental Protection Agency, Cincinnati, Ohio.

NORTH LOUISIANA STUDY AREA

APPENDIX C-4

FLOOD PLAIN DELINEATION

VACHERIE DOME

Flood analysis for the Vacherie Dome site was limited to that portion of Black Lake Bayou watershed upstream of the confluence of Kepler Creek, which is approximately 19 km (12 mi) downstream of the site. This confluence is far enough downstream to account for possible backwater effects due to ponding in the swampy, braided reaches of Black Lake Bayou downstream of Bashaway Creek, and far enough upstream not to be affected by backwater from Black Lake (Figure 11-13). The drainage area of Black Lake Bayou at Kepler Creek is 862 km^2 (333 mi^2).

A design storm of 48 hours was chosen and the corresponding probable mazimum precipitation (PMP) value for 26 km^2 (10 mi^2) or less was taken from Schneider and Riedel (1978). The PMP was determined to be 965 mm (38 in). Typical PMP details such as storm configuration, maximization procedures, time effects, antecedent storm sequence, etc., were not analyzed separately.

The hydrologic response characteristics that needed to be identified included absorption capability of soils and time of concentration of hydrographs for subwatersheds. The absorption capability of soils in the watersheds was estimated through the Soil Conservation Service (SCS) Soil Curve Number. A design value of 80 was chosen as a conservative estimate for pasture,

meadow, and forest land. The initial soil condition was assumed to be saturated. Times of concentration were calculated using standard methods (SCS, 1975).

Thirteen cross sections were selected on Black Lake Bayou and five cross sections were selected on Bashaway Creek for use in the computations. Incremental drainage areas and flood-plain lengths between cross sections were measured from USGS 15-minute quadrangle maps. Each cross section was rated at incremental elevations for cross-sectional area and discharge, assuming constant slope between 20 foot contours and solving the Chezy-Manning equation for uniform flow:

$$Q = \frac{1.49}{n} AR^{2/3}S^{1/2}$$

where:

Q = discharge (L^3/T);

n = Manning's "n", (roughness coefficient);

A = cross-sectional area, (L^2);

R = hydraulic radius, (L); and

S = energy gradeline slope, (assumed equal to stream bed slope).

A conservative value of 0.1 was assumed for Manning's "n" in the computation.

Cross-sectional data were input to SCS TR-20 Flood Routing Computer Program for computation at each section based on PMP and estimated hydrologic response characteristics of the watershed. Resultant hydrographs were routed downstream and added together using the SCS Convex Routing Method and flood plain lengths.

The stream backwater profile for probable maximum flood (PMF) was computed using the Army Corps of Engineers HEC-2 Surface Water Profile Program (U.S. Army Corps of Engineers, 1976). This method applies Bernoulli's theorem and Manning's frictional loss equation to solve for the total energy at each cross section. Cross sectional data were input to HEC-2 for each stream reach, along with peak discharge data derived using TR-20. These discharges were assumed to be steady-state discharges at each cross section. The program generated flood elevations at each cross section using the inputted data. The area inundated by the PMF was determined by interpolating between cross sections.

RAYBURN'S DOME

Flood Analysis for the Rayburn's Dome site was performed on Fouse Bayou and Muddy Creek (Figure 11-13). The PMF was developed for the entire Fouse Bayou watershed and a backwater profile was computed. Because of the similarity of Muddy Creek watershed to Fouse Bayou watershed, and the fact that the downstream reaches caused no significant backwater effects on Fouse Bayou, the flood analysis for Muddy Creek was limited to that portion of the watershed upstream of State Highway 155 at Friendship. The drainage area of Muddy Creek at this point is 21 km^2 (8.1 mi^2).

A design storm of 48 hours was chosen and the corresponding PMP value for 26 km^2 (10 mi^2) or less was taken from Schneider and Riedel (1978). The PMP was determined to be 1,196 mm (47.1 in). Typical PMP details such as storm configuration,

maximization procedures, time effects, antecedent storm sequences, etc., were not analyzed separately.

The absorptive capacity of soils in the watershed was estimated through the SCS Soil Curve Number. A design value of 80 was chosen as a conservative estimate for pasture, meadow, and forest. Initial soil condition was assumed to be saturated. There were no other allowances for antecedent precipitation conditions.

The SCS TR-20 Flood Routing Computer Program was used to develop runoff hydrographs for the PMF. The procedures used are similar to those used for Vacherie Dome.

APPENDIX C-4

REFERENCES

Schneider, L. C. and J. T. Riedel; 1978; Probable maximum precipitation estimates, United States east of the 105th meridian; hydrometeorological Report No. 51, U.S. Department of Commerce, National Oceanic and Atmospheric Administration; U. S. Department of the Army, Corps of Engineers.

Soil Conservation Service, 1974, Urban hydrology for small watersheds: U.S. Department of Agriculture Soil Conservation Service Engineering Division, Technical Release No. 55.

Soil Conservation Service, 1965, Computer program for project formulation, hydrology: Soil Conservation Service Technical Release No. 20, 28 p.

U.S. Army Corps of Engineers, 1976, Generalized computer program HEC-2, water surface profiles: Hydrology Engineering Center, U.S. Army Corps of Engineers, 17 p.

APPENDIX D

Surface Geology

NORTH LOUISIANA STUDY AREA

APPENDIX D-1

REMOTE SENSING

Remote sensing studies in Louisiana were conducted by Dr. Roy Welch under contract to LETCo. These studies identified trends and anomalies in the lineament and drainage patterns in the North Louisiana Study Area. These trends and anomalies were used to help interpret the structural stability in the study area and in the vicinity of the two candidate domes.

High-altitude color infrared photographs, Landsat and side-looking-airborne-radar imagery (SLAR), USDA low-altitude black and white photographs, and USGS topographic maps were used to identify lineaments and drainage patterns in the study area and in near-dome areas. Dr. Welch's report is attached. The original report figures were reduced for presentation and, in some instances, modified slightly by LETCo personnel for clarification. Lineaments interpreted by Lewis of LSU/IES (in Martinez and others, 1977) from SLAR and low-altitude color imagery were incorporated in the near-dome lineament maps (Volume IV, Figures 10-8 and 10-27).

A list of the purchased imagery and the imagery flown specifically for the Area Characterization study is presented in Table D-1.1.

NORTH LOUISIANA STUDY AREA

APPENDIX D-1

TABLE D-1.1 (Page 1 of 3)

AERIAL PHOTOGRAPHS AND IMAGERY

PURCHASED IMAGERY

1. Landsat

1 black and white print, band 5, scale 1:250,000
1 black and white print, band 7, scale 1:250,000
1 positive transparency, band 5, scale 1:1,000,000
1 positive transparency, band 7, scale 1:1,000,000
1 false color composite, bands 4, 5, 7, scale 1:250,000 of:

Path	Row	Scene	Date
25	38	8237315590500	1/30/76
26	37	8273415530500	1/25/77
26	38	8373415532500	1/25/77

2. NASA

1 color infrared print, scale 1:120,000 of:

Mission	Roll	Frame
289	15	58-63 72-82 129-140 142-149 205-210

1 color infrared positive transparency, scale 1:120,000 of:

Mission	Roll	Frame
289	15	58-61 75-81 129-135

3. USGS Orthophotoquads

18 black and white positive transparencies for stereo coverage, scale 1:80,000;

8 black and white diazo prints, scale 1:24,000; and

PURCHASED IMAGERY (Continued)

5. SLAR (used in Area Characterization study by LETCo, but flown and paid for by LSU/IES in July, 1976)

1 black and white negative and print of each of 12 flight lines, scale 1:400,000

1 mosaic of south look lines, scale 1:100,000

1 mosaic of west look lines, scale 1:100,000

IMAGERY FLOWN FOR THE AREA CHARACTERIZATION STUDY

1. THERMAL

black and white images on 5-inch film format strips, scale 1:24,000 and

color images on 70mm film format strips, scale 1:48,000

Each strip covers an area approximately 2 miles* by eight miles, and

Each set of strips covers an area of approximately 64 square miles** centered on a dome.

Vacherie Dome Vicinity

8 strips Quantitative analog black and white (negative and print)

8 strips Analog/contour black and white (negative and print)

8 strips 8-level color (negative and print)

Rayburn's Dome Vicinity

8 strips Quantitative analog black and white (negative and print)

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*To convert to kilometers, multiply by 1.609.
**To convert to square kilometers, multiply by 2.590.

PURCHASED IMAGERY (Continued)

8 black and white negative transparencies of:

Bienville SE, SW;

Jamestown NE, NW;

Gibsland SE, SW; and

Goldonna NE, NW topographic quadrangles

4. United States Department of Agriculture

1 black and white print, scale 1:20,000 of:

Vacherie Dome Vicinity

Mission	Flight Line	Frame	Date
CEW	2HH	58-64 118-126 139-148 206-212	10/16/66
	3HH	1-3	10/25/66
CFB	4HH	276-284	10/27/66
	5HH	8-13 17-22	10/29/66
CEW	1W	10-18 57-66 83-84 90-94	1/10/59
	1W	130-136 141-143	3/02/59

Rayburn's Dome Vicinity

Mission	Flight Line	Frame	Date
CEW	1HH	18-29 122-133 140-151	10/16/66
	2G	78-89 130-141 151-162	2/19/50

Report to LETCO

12/21/79

REMOTE SENSING STUDY OF LINEAMENT/DRAINAGE PATTERNS IN THE NORTH LOUISIANA STUDY AREA

R. Welch[1]

INTRODUCTION

The primary objectives of this study have been: 1) to map the lineaments visible on various forms of imagery covering the North Louisiana Basin study area; 2) to map the drainage network which covers the study area from USGS topographic maps; and 3) to briefly describe the resulting lineament and drainage patterns as an aid in assessing the stability of the Vacherie and Rayburns salt domes, which are located within the study area. The study area covers approximately 1,315 square miles in the North Louisiana Basin, centering on the Vacherie and Rayburns salt domes. A map of the study area, showing the domes along with the principal drainage network, accompanies this report (Fig. 1).

This is a region of only slight topographic relief, and is dominated by river or stream valleys bordered by broad, marshy areas. Much of the area is forested, although grazing and agriculture are prominent on the landscape as well. Vegetation in the marsh areas is very dense, making natural lineaments more difficult to discern.

PROCEDURE

Three forms of imagery were employed in this study: NASA color infrared high altitude photographs, Landsat imagery, and side-looking airborne radar mosaics. Complete descriptions of imagery and map products used in the study are found in (Tables 1&2). Maps at a scale of 1:100,000 have been produced which span the entire study area and

[1]This project was undertaken by Steve Mathews and Tom Jordan under the direction of Dr. Roy Welch.

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TABLE 1*

IMAGE DATA

Images	Date	Type
Landsat E-2734-15532	1/25/77	Bands 5 & 7, Color Composite
Landsat E-2734-15530	1/25/77	Bands 5 & 7, Color Composite
SLAR 3-L-90		South look direction
SLAR 4-L-5		West look direction

NASA/JSC High Altitude Color Infrared Photographs - November, 1974
(Print and Transparency Formats)

Imagery	Number of Images
15-058 to 15-061	4
15-075 to 15-081	6
15-129 to 15-135	7
Total	17

* Table Number From Original Report

TABLE 2*

USGS MAPS OF STUDY AREA

U.S. Geological Survey Topographic Sheets

1:250,000 Scale:

NE 15-2	Alexandria, 1973
NI 15-11	Shreveport, 1973

1:62,500 Scale:

AMS 7349 III	Minden, 1947
AMS 7348 II	Ashland, 1957
AMS 7449 III	Arcadia, 1969
AMS 7448 I	Hodge, 1972
AMS 7448 II	Jonesboro, 1949
AMS 7348 IV	Ringgold, 1972
N3200-W9245	Goldonna, 1957
AMS 7448 IV	Bienville, 1972
AMS 7349 II	Gibsland, 1969
AMS 7348 I	Jamestown, 1967

1:24,000 Scale:

AMS 7348 IV NE	Heflin, 1972
AMS 7348 IV NW	Koran, 1972
AMS 7348 IV SW	Bossier Point, 1972
AMS 7348 IV SE	Ringgold, 1972

* Table Number From Original Report

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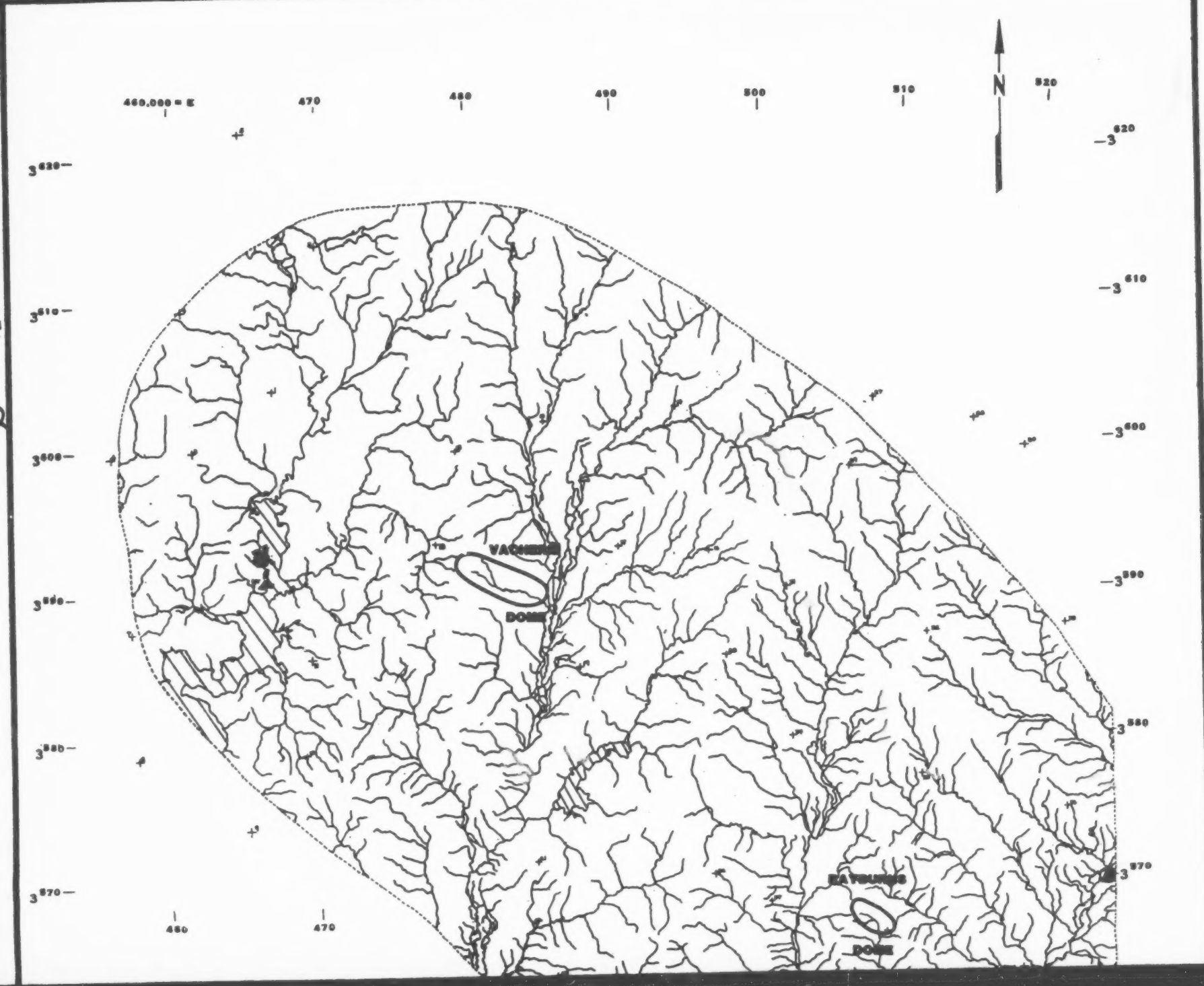

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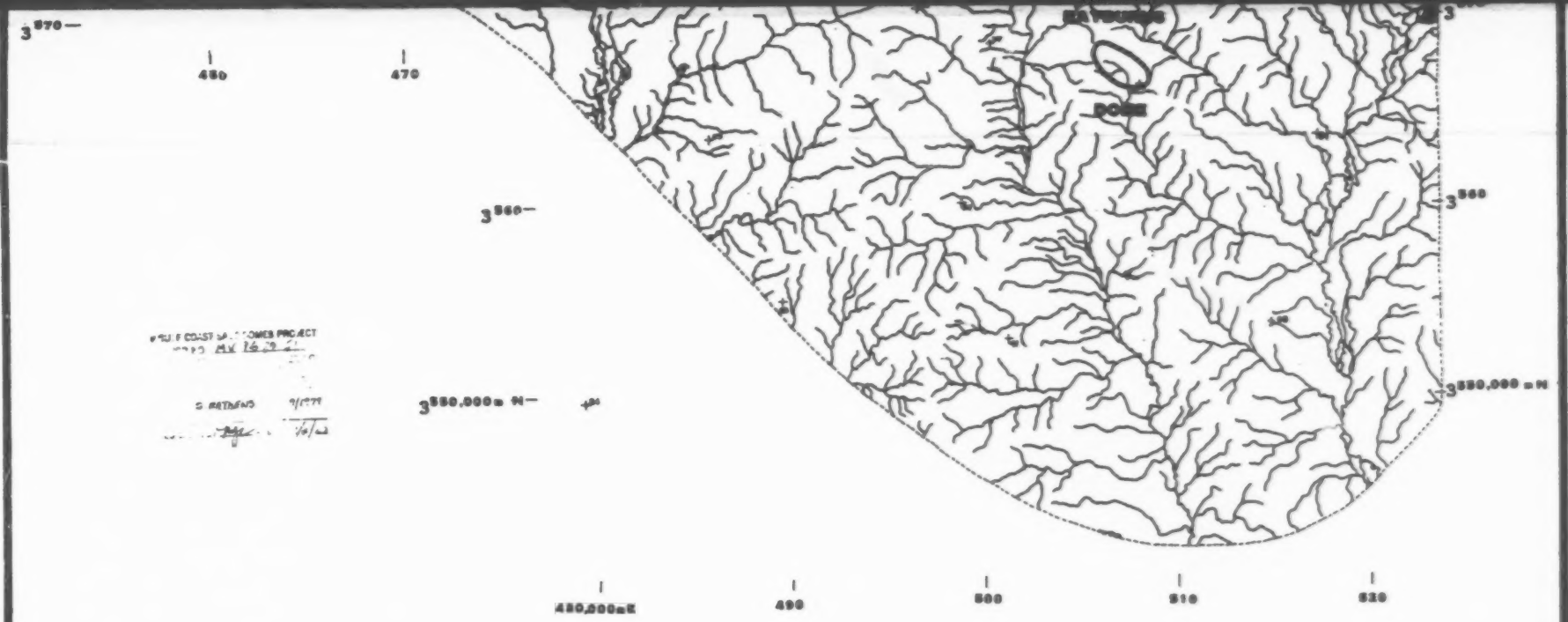

NORTH LOUISIANA STUDY AREA - APPENDIX D

FIGURE 1* DRAINAGE

NOTE

ORIGINAL SCALE WAS 1:100,000. FIGURE REDUCED BY LAW ENGINEERING PERSONNEL TO SCALE SHOWN

* FIGURE NUMBER FROM ORIGINAL REPORT

5 0 5 MILES

8 4 0 8 KILOMETERS

FIGURE 1

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consist of: drainage patterns; and lineaments as detected on the CIR air photos, Landsat bands 5 and 7, and the two SLAR mosaics. These maps are all in common registration, and are tied to 41 control points selected from USGS 1:62,500 topographic sheets.

Index maps which overlay the USGS 1:250,000 Shreveport, La. map illustrate both CIR air photo coverage (Fig. 2), and Landsat and SLAR coverage (Fig. 3) of the study area. These overlays also show the boundary of the study area and the location of Vacherie and Rayburns salt domes.

A) Lineaments

As in previous studies, three criteria were employed when identifying lineaments on all forms of imagery used:

1. Topographic relief- ridges and valleys with definite linear orientation- this criterion proved most important in radar and CIR air photo analysis.
2. Controlled drainage- straight stream segments, chains of lakes or ponds, abrupt changes in the course of rivers and streams. This factor was important with all forms of imagery analyzed, and in many cases controlled drainage was accompanied by linear topographic relief.
3. Distinct tonal contrasts- linear boundaries due to vegetative patterns, soil moisture, etc. - an important criterion for lineament identification on all image types examined, especially Landsat.

Every effort was made by the image interpreters to apply these criteria consistently throughout the study, and on each type of imagery utilized.

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B) Drainage and Ground Control

The stream network draining the study area was compiled from 1:62,500 scale USGS topographic quadrangles. Mylar sheets were placed over each topographic map, and the ground control points found on the map were traced and numbered, along with all streams and rivers shown on the map.

The mylar overlays depicting the stream network and ground control points were photographically reduced to 1:100,000 scale positive prints. These eight prints were then mosaicked together - the fit was reasonably good. A sheet of mylar was placed over this mosaic, and the streams and control points were traced on to it. This 1:100,000 scale map was used as a base sheet to provide ground control points for all the other maps which were constructed (Fig. 1).

C) Color Infrared Air Photographs

NASA high altitude color infrared photographs were employed to delineate lineaments covering the study area. These photos are at 1:120,000 scale, and each covers approximately 290 square miles.

Photos covering the entire study area were examined by two interpreters through Dietzgen mirror stereoscopes. Clear plastic overlays were registered to each print, and each interpreter independently examined the entire study area, annotating the lineaments on the overlays. The sets of overlays were superimposed in register for comparison, and lineaments noted to be coincident were transferred to a separate master overlay. This master overlay was enlarged on a Saltzman projector to a scale of 1:100,000 and registered to the ground control points of the drainage overlay. Criteria for each lineament on the overlay is noted beside the lineament (Fig. 4).

410,000m E 420 430 440 450 460 470 480 490 500 510 520 530 540 550 560 570 580 590

3650 3640 3630 3620 3610 3600 3590 3580 3570 3560 3550,000m N

N

058 059 060 061 062 080 079 078 077 076 075 129 130 131 132 133 134 135

VACHERIE DOME

RAYBURNS DOME

8 4 0 8 MILES

10 5 0 10 KILOMETERS

GULF COAST SALT DOMES PROJECT
JOB NO. MV 5682
PREPARED FOR LAW ENGINEERING
DRAWN S. RAYBURNS DATE 9/1/79
CHECKED BY GHF DATE 9/10/81
LETCO CHECK BY [illegible] DATE [illegible]

NORTH LOUISIANA STUDY AREA - APPENDIX D

FIGURE 2* HIGH-ALTITUDE COLOR INFRARED PHOTOGRAPH COVERAGE

NOTE:

ORIGINAL SCALE WAS 1: 250,000. FIGURE REDUCED BY LAW ENGINEERING PERSONNEL TO SCALE SHOWN

ALL FRAMES SHOWN ARE FROM MISSION 289, ROLL 15

[redacted] FIGURE 2

* FIGURE NUMBER FROM ORIGINAL REPORT

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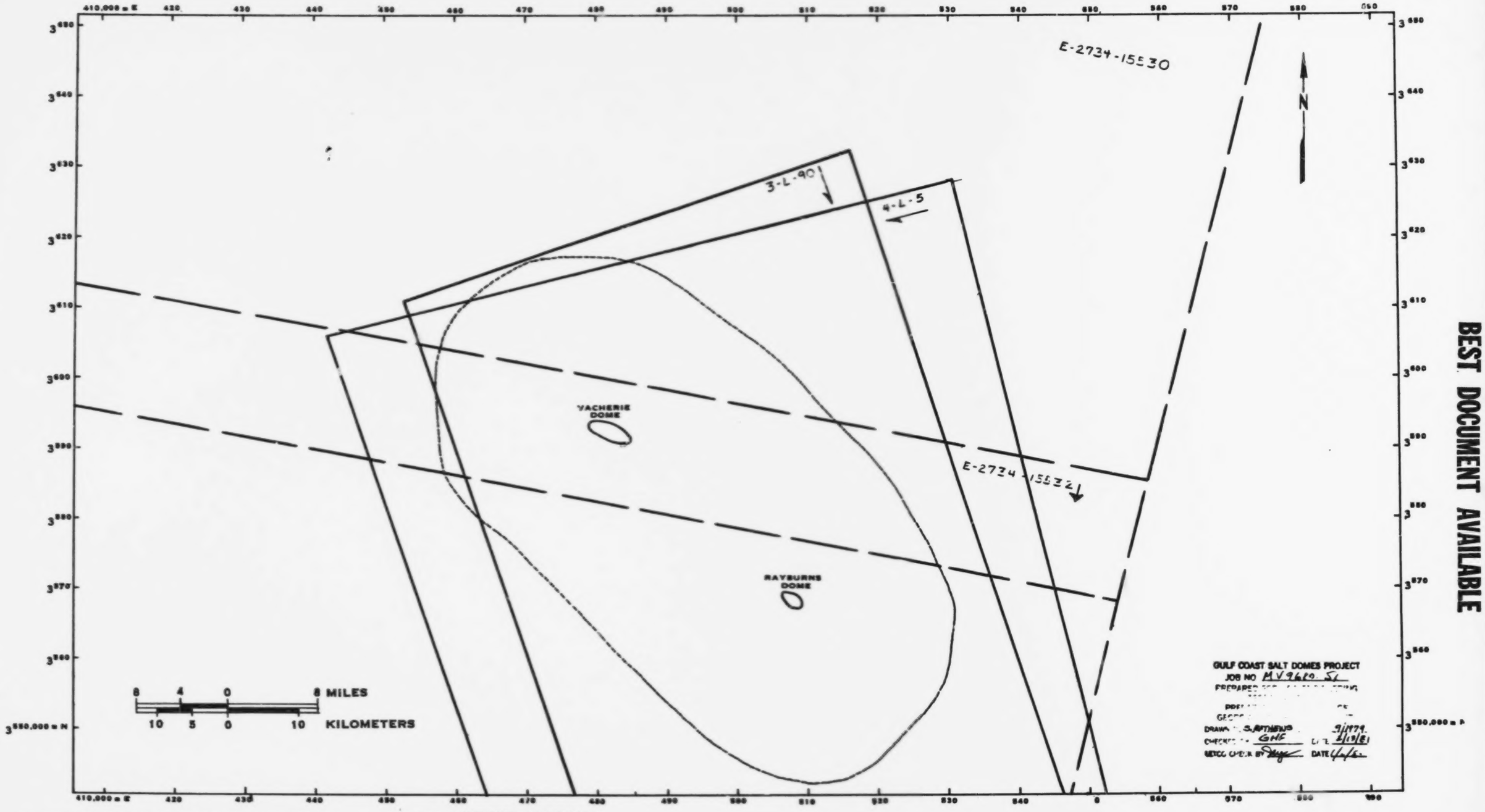


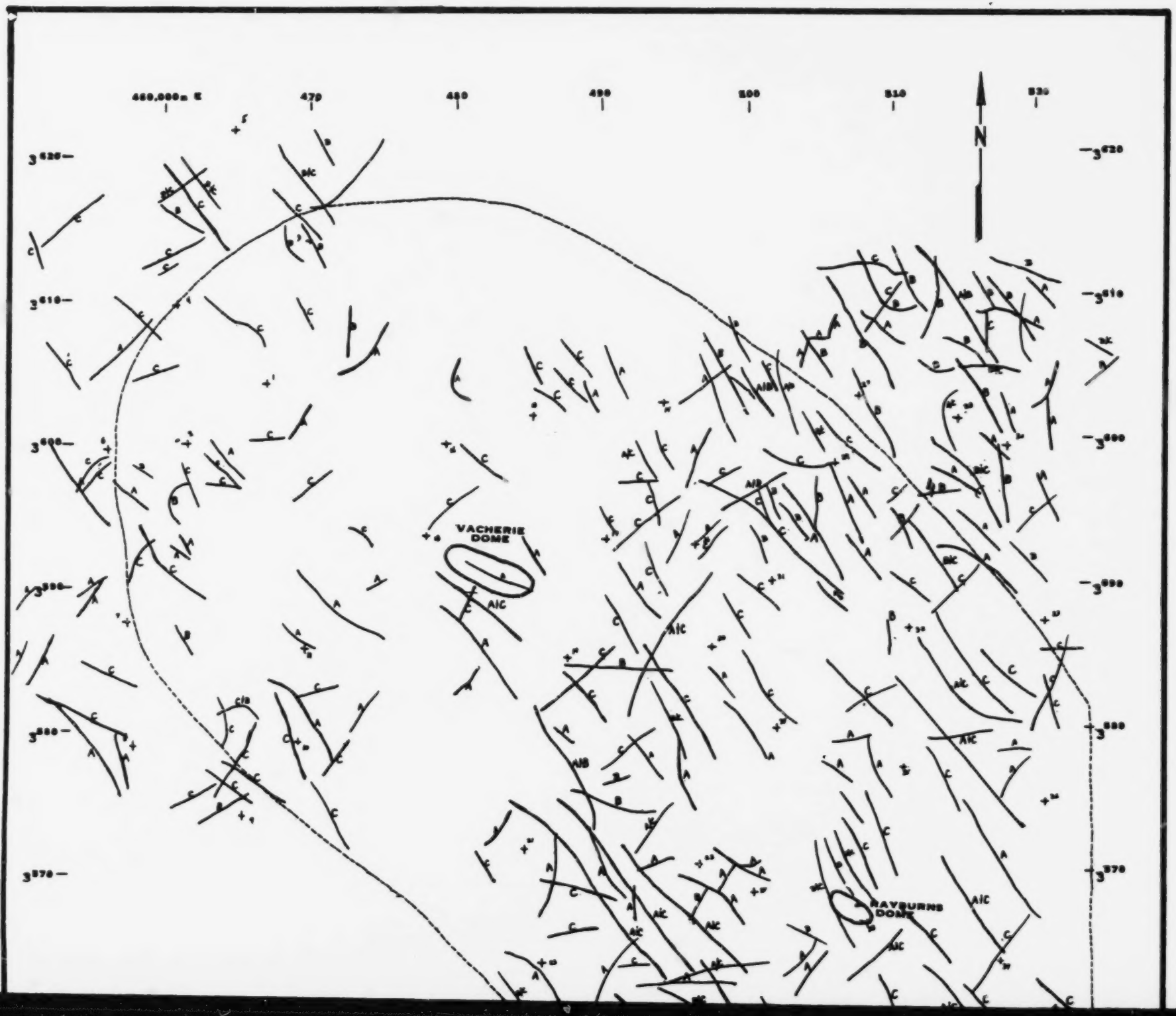
NORTH LOUISIANA STUDY AREA - APPENDIX D
FIGURE 3* LANDSAT AND SLAR COVERAGE

——— LANDSAT COVERAGE
——— RADAR COVERAGE
(ARROWS INDICATE SLAR LOOK DIRECTION)

NOTE:
ORIGINAL SCALE WAS 1: 250,000. FIGURE REDUCED BY LAW ENGINEERING PERSONNEL TO SCALE SHOWN

* FIGURE NUMBER FROM ORIGINAL REPORT

[redacted] FIGURE 3



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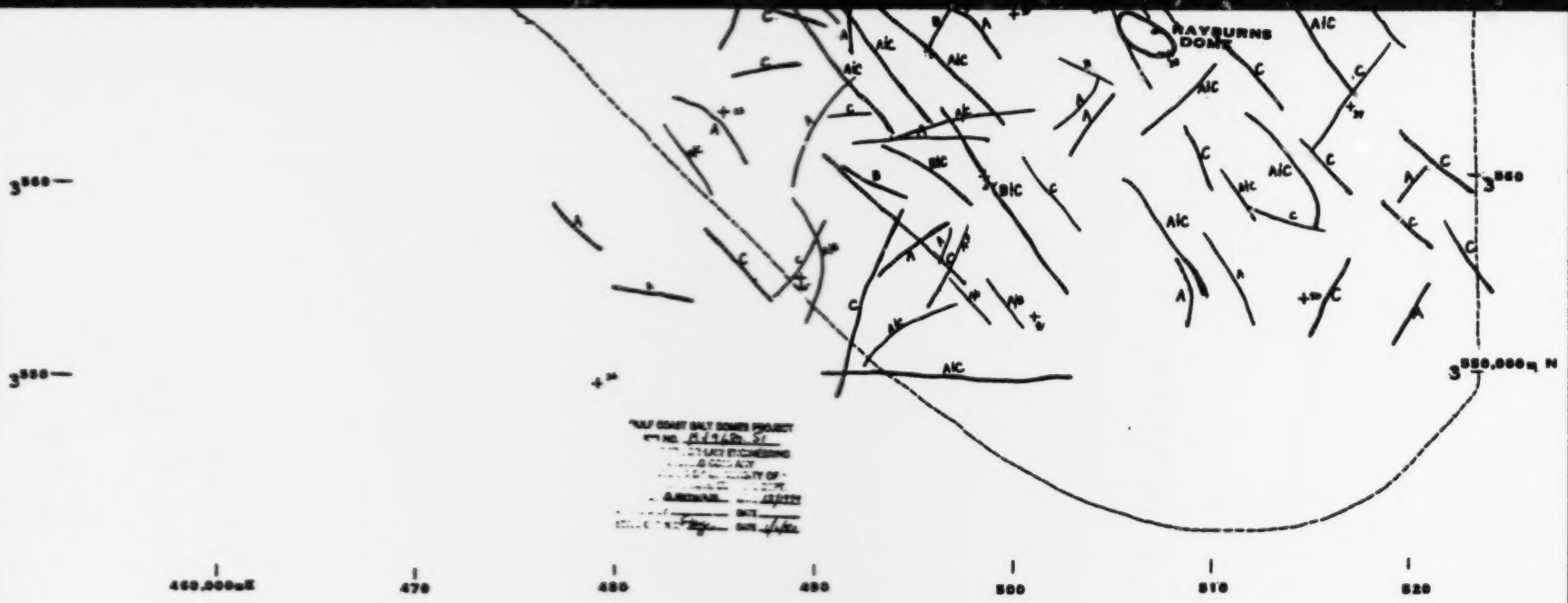

LINEAMENT CRITERIA:

A - DRAINAGE
B - TOPOGRAPHIC RELIEF
C - TONAL CONTRAST

NORTH LOUISIANA STUDY AREA - APPENDIX D

FIGURE 4* LINEAMENTS DETECTED ON NASA HIGH ALTITUDE COLOR INFRARED PHOTOGRAPHS

NOTE

ORIGINAL SCALE WAS 1:100,000. FIGURE REDUCED BY LAW ENGINEERING PERSONNEL TO SCALE SHOWN.

* FIGURE NUMBER FROM ORIGINAL REPORT

5 0 5 MILES

8 4 0 8 KILOMETERS

147A

FIGURE 4

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Initially, the photos examined were in a paper print format. Subsequent study of the photos in transparency format yielded more lineaments, which are shown in a different color on the overlay.

D) Landsat

The study area is located on small portions of two Landsat images. Both images were taken in January of 1977, a time when vegetation is at a minimum, and the underlying terrain is most clearly observed. Paper prints of 1:250,000 scale black and white images in bands 5 and 7 were examined, and all lineaments traced on to clear plastic overlays. Both color composite images were too dark and lacking in contrast to reveal lineaments. Careful cross checking was performed to insure that man-made features were not mistakenly identified as lineaments. Transparancies at 1:1,000,000 scale of the two scenes were examined under a Bausch and Lomb Zoom 70 viewing system in an effort to discern lineaments not visible on the larger scale prints, but few additional lineaments were revealed. The acetate overlays were enlarged on a Saltzman projector to a scale of 1:100,000 and registered to the ground control points of the drainage overlay. The Landsat band from which each lineament was detected is noted beside the lineament (Fig. 5).

E) SLAR

Side-looking airborne radar imagery covering the study area with both west and south "look" directions at a scale of 1:100,000 was examined. This imagery is in the form of a mosaic of several flight lines spliced together, with little apparent geometric distortion.

A clear plastic overlay was placed over both SLAR images, and

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lineaments based on tonal/textural contrasts and topographic relief as evidenced by radar "shadow" were traced onto the overlays. Precautions were taken to insure that man-made objects were not mistaken for lineaments. These overlays were registered to the 1:100,000 control points of the drainage overlay. A composite overlay was constructed, and appears as (Fig. 6).

CONCLUSIONS FROM VISUAL ANALYSIS OF IMAGERY

A) Color Infrared Air Photographs

A large number of lineaments were identified on the color infrared air photographs, especially when transparencies were utilized. The lineament map (Fig. 4) prepared from the interpretation of these photos is felt to be the most reliable and accurate of all the maps produced from various imagery types.

Examination of figure 4 reveals a very dominant NW-SE trend in lineament orientation, which is also a dominant trend in the drainage network (Fig. 1). Lineaments average about 4 miles in length on the map, though some are much longer, as near control points 22 and 24. A secondary trend of NE-SW is also evident on the map, at right angles to the dominant trend. Areas of slight to moderate local relief were found to contain more linear features, usually related to topography and/or controlled drainage, as exemplified near control points 29 and 30.

Lineaments are less numerous near the Vacherie dome, and most found in that vicinity are related to drainage or tonal features. A slightly higher concentration of lineaments was observed near the Rayburns dome, many of which were discerned only on the transparencies.

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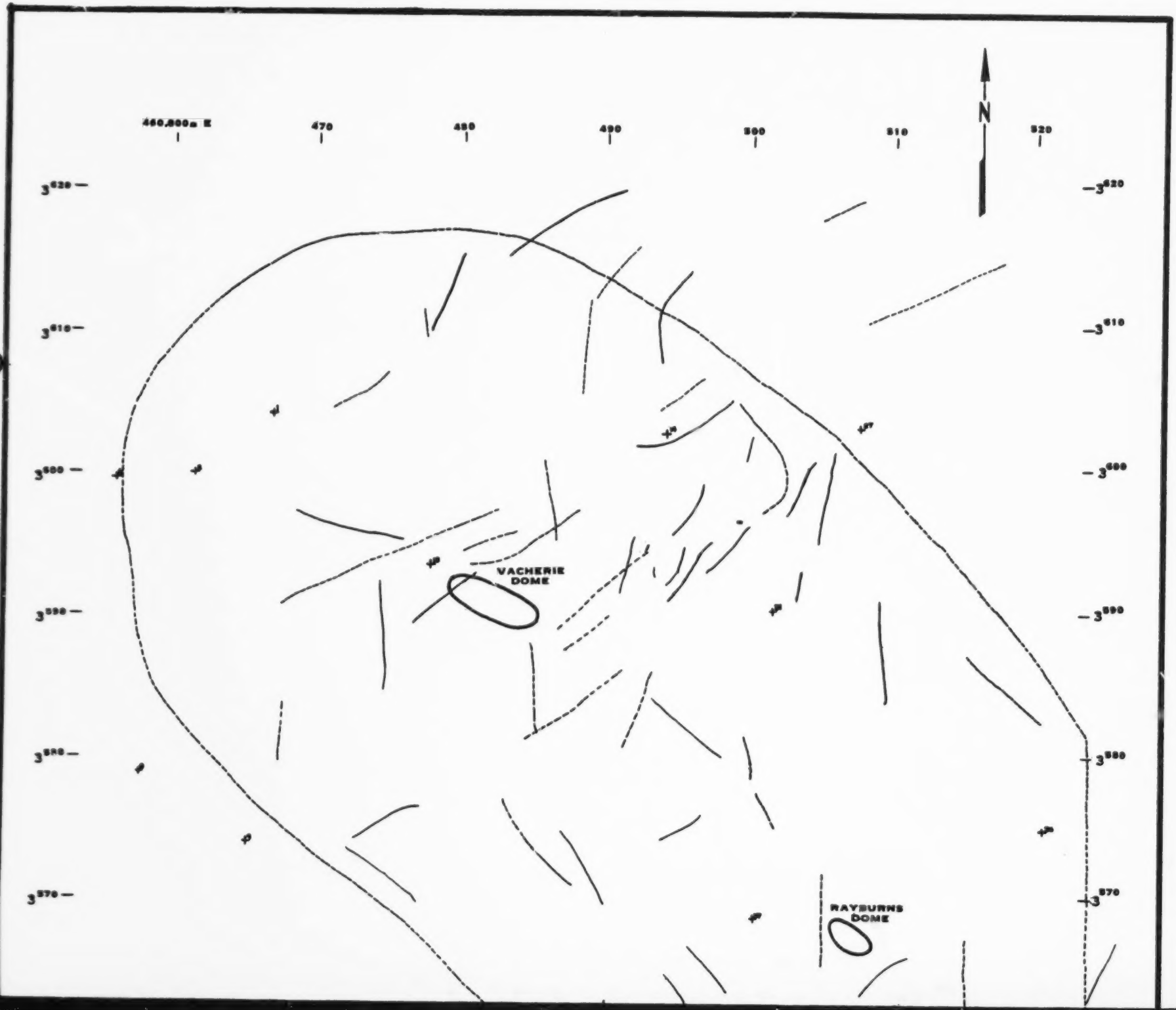

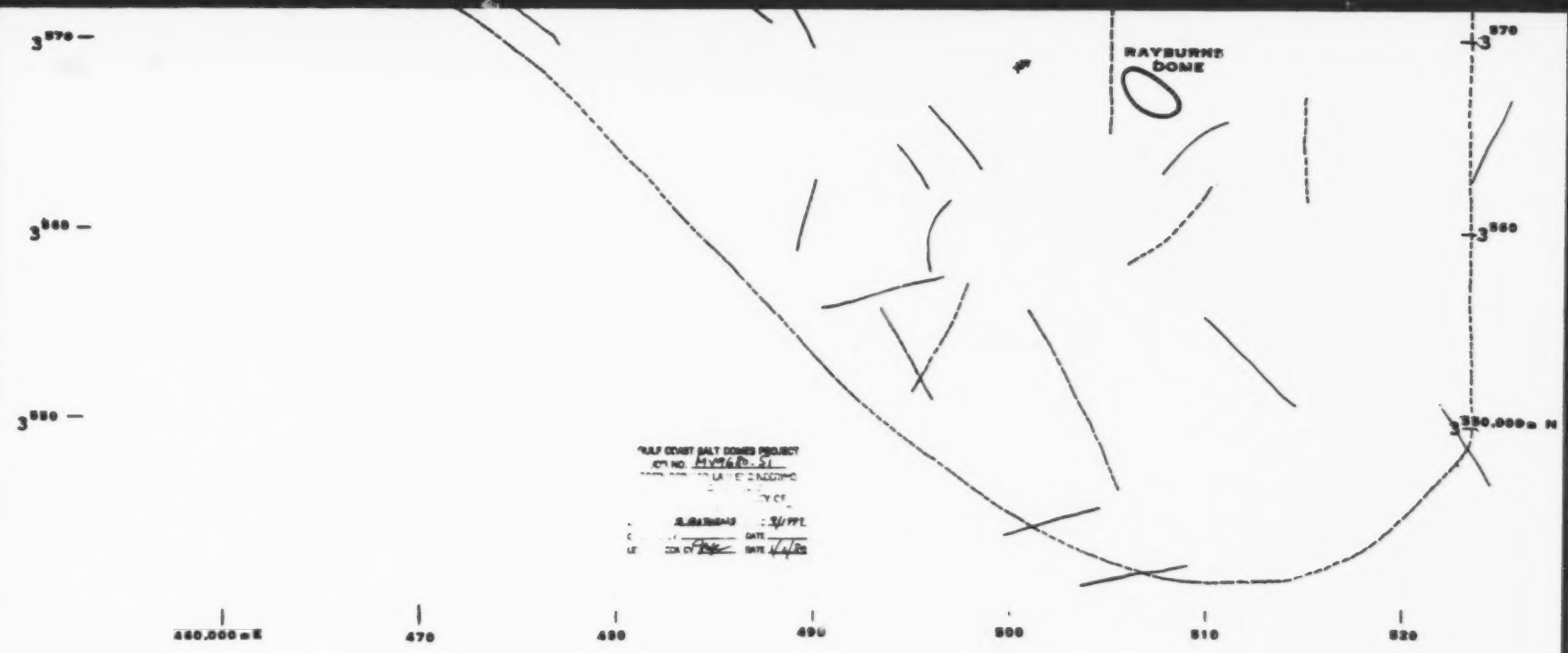

BAND 5

BAND 7

NORTH LOUISIANA STUDY AREA - APPENDIX D

FIGURE 5* LINEAMENTS DETECTED ON LANDSAT IMAGERY

NOTE

ORIGINAL SCALE WAS 1:100,000. FIGURE REDUCED BY LAW ENGINEERING PERSONNEL TO SCALE SHOWN

* FIGURE NUMBER FROM ORIGINAL REPORT

5 0 5 MILES

8 4 0 8 KILOMETERS

184

[redacted]

FIGURE 5

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FLT. 4-L-6 WEST LOOK DIRECTION

FLT. 3-L-90 SOUTH LOOK DIRECTION

NORTH LOUISIANA STUDY AREA - APPENDIX D

FIGURE 6 * LINEAMENTS DETECT ON SIDE LOOKING AIRBORNE RADAR IMAGERY

5 0 5 MILES

8 4 0 8 KILOMETERS

NOTE

ORIGINAL SCALE WAS 1:100,000. FIGURE REDUCED BY LAW ENGINEERING PERSONNEL TO SCALE SHOWN.

* FIGURE NUMBER FROM ORIGINAL REPORT

FIGURE 6

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B) Landsat

Interpretation of Landsat imagery of the study area yielded relatively few lineaments when compared to the CIR air photos. Lineaments detected on Landsat imagery are mapped on (Fig. 5). The study area is of such limited local relief that most linear features were identified by tonal contrasts.

Like the CIR-detected lineaments, these average about 5 miles in length, and show definite NW-SE and NE-SW trends in orientation, with the latter being slightly more prevalent. Many lineaments correlate with drainage patterns, such as those just east and south of the Vacherie dome (Fig. 5).

When the Landsat map (Fig. 5) is placed over the CIR map (Fig. 4), many lineaments are found to be common to both. Some lineaments were detected on Landsat, but not the CIR air photos- the reliability of these should be seriously questioned. Due to the small scale and coarseness of Landsat imagery, it is felt that lineaments detected on it are not as high in reliability as those detected on the CIR air photos.

C) SLAR

A previous study by Dellwig and Bare of radar imagery of this region concludes that SLAR is of only marginal utility when attempting to delineate lineaments and domes in highly vegetated areas of very limited local relief.[1] Local relief in the study area on the imagery utilized in this investigation was occasionally enough

[1]Louis F. Dellwig and Janet E. Bare, "A Radar Investigation of North Louisiana Salt Domes," Photogrammetric Engineering and Remote Sensing 44 (November 1978): 1411-19.

to cause a radar "shadow" to appear on the imagery, and textural and tonal contrasts were plainly visible. A small number of lineaments were detected on the imagery from these textural/tonal contrasts, and mapped as (Fig. 6).

Lineaments mapped from radar imagery exhibit the usual NW-SE dominant trend, and are short in length, averaging 2-3 miles. These lineaments exhibit very little correlation with drainage patterns (Fig. 1), and with the lineaments detected on other imagery (Figs. 4&5). Like the study mentioned above, it is felt that radar imagery is ineffective for detecting lineaments in this region. The lineaments mapped should be considered low in reliability.

SUMMARY

Analysis of Landsat, SLAR, and color infrared aerial photographic imagery of the Louisiana study area has resulted in the preparation of 1:100,000 scale maps of lineaments and drainage patterns. Lineaments detected on Landsat imagery and the CIR photographs illustrate a dominant NW-SE orientation, both of which correlate well with the drainage network. Further examination of the lineament patterns as mapped may aid in the assessment of the stability of the Vacherie and Rayburns salt domes, as well as providing clues to geologic activity in the area.

NORTH LOUISIANA STUDY AREA

APPENDIX D-2

TERRACE AND GEOLOGIC MAPPING DATA

The data used to construct surface geologic maps (Volume III, Figures 9-5, 10-7, and 10-26) for the geologic characterization of the North Louisiana Study Area were obtained from published reports, resistivity surveys conducted by LETCo (See Appendices E-1 and E-2), and field geologic mapping performed by LETCo. The study area geologic map (Figure 9-5) was taken from Martinez and others (1976) (LSU/IES Annual Report), and modified with the Vacherie and Rayburn's Dome geologic maps prepared by LETCo personnel and with the published Chestnut Dome geologic map by Dinnean (1958).

The Vacherie and Rayburn's Dome geologic maps (Volume IV Figures 10-7 and 10-26) were modified by LETCo personnel from published maps by Martin and others (1954) and Martinez and others (1976). Modifications of the published maps were based on field geologic mapping by LETCo, on resistivity surveys conducted by LETCo, on shallow boring and hydrologic well data collected and interpreted by Kolb in Martinez and others (1977, 1978, and 1979), on low-altitude aerial photographs (Appendix D-1), and on oil and gas well data interpreted from purchased geophysical logs (Appendix A-3 and Volume IV, Tables 10-1 and 10-2) (see LETCo report Surface Geological Reconnaissance of Vacherie Dome, Bienville and Webster Parishes, Louisiana).

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APPENDIX D-2

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Dinnean, R.F., 1958, Geology of the Chestnut salt dome area, Natchitoches Parish, Louisiana: Louisiana Geological Survey, Geological Survey, Geological Summary no. 1, 11p.

Martin, J.L., Hough, L.W., and others, 1954, Geology of Webster Parish: Louisiana Geological Survey, Bulletin 29, 252 p.

Martinez, J. D., and others, 1976, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report ORNL-Sub-4112-15, 329 p.

Martinez, J. D., and others, 1977, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report Y/OWI/Sub-4112/37, 475 p.

Martinez, J. D., and others, 1978, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report EW-78-C-05-5941/53, 700 p.

Martinez, J. D., and others, 1979, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies, Annual Report, 572 p.

APPENDIX E

Geophysics

NORoH LOUISIANA STUDY AREA

APPENDIX E-1

RESISTIVITY VERTICAL SOUNDINGS

Electrical resistivity surveys involving vertical soundings were made by LETCo personnel in the areas adjacent to Rayburn's and Vacherie Domes. The analysis of these soundings aided in understanding the near-surface geology. The soundings were performed concurrently with resistivity horizontal profiles (Appendix E-2). All work was done in accordance with LETCo Engineering Procedure No. 3.2, "Ground Level Resistivity Surveys-Data Collection". The work was performed with an A.B.E.M. Terrameter 4-cycle direct-current resistivity meter with the electrodes in a Wenner array. The spacing between electrodes, or "a" spacing, was varied from 0.6 meter (2 ft) to a maximum of 259 meters (850 ft). The value measured in these surveys is electrical resistivity, i.e., the amount of resistance of a material to flow of electric current per unit cross-sectional area divided by unit length. The units of resistivity are in terms of electrical resistance multiplied by distance, typically ohm-feet (Ω').

The soundings were interpreted using the inverse slope method and the results are presented in the form of pseudologs. The interpretation of the pseudologs yields approximate depths to boundaries between geo-electric units that generally correspond to lithologic units. The depths to geo-electric boundaries are considered to be approximately equal to the "a" spacing. The

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appearance of thin geo-electric units in the pseudologs may be caused by lateral variation in the resistivity of surface material rather than by a change at depth.

Twelve electrical resistivity soundings were conducted in the vicinity of Rayburns Dome between August and September, 1978. The locations of the soundings are shown in Figure E-1.1 and the pseudologs are presented in Table E-1.1.

Twenty-eight electrical resistivity soundings were conducted in the vicinity of Vacherie Dome between July, 1978 and April, 1979. The locations of the soundings are shown in Figure E-1.2 and the pseudologs are presented in Table E-1.2. Soundings were conducted in 1981 as part of surface geologic reconnaissance. The locations of these soundings are presented in a Law Engineering report entitled Surface Geological Reconnaissance of Vacherie Dome, Bienville and Webster Parishes, Louisiana.

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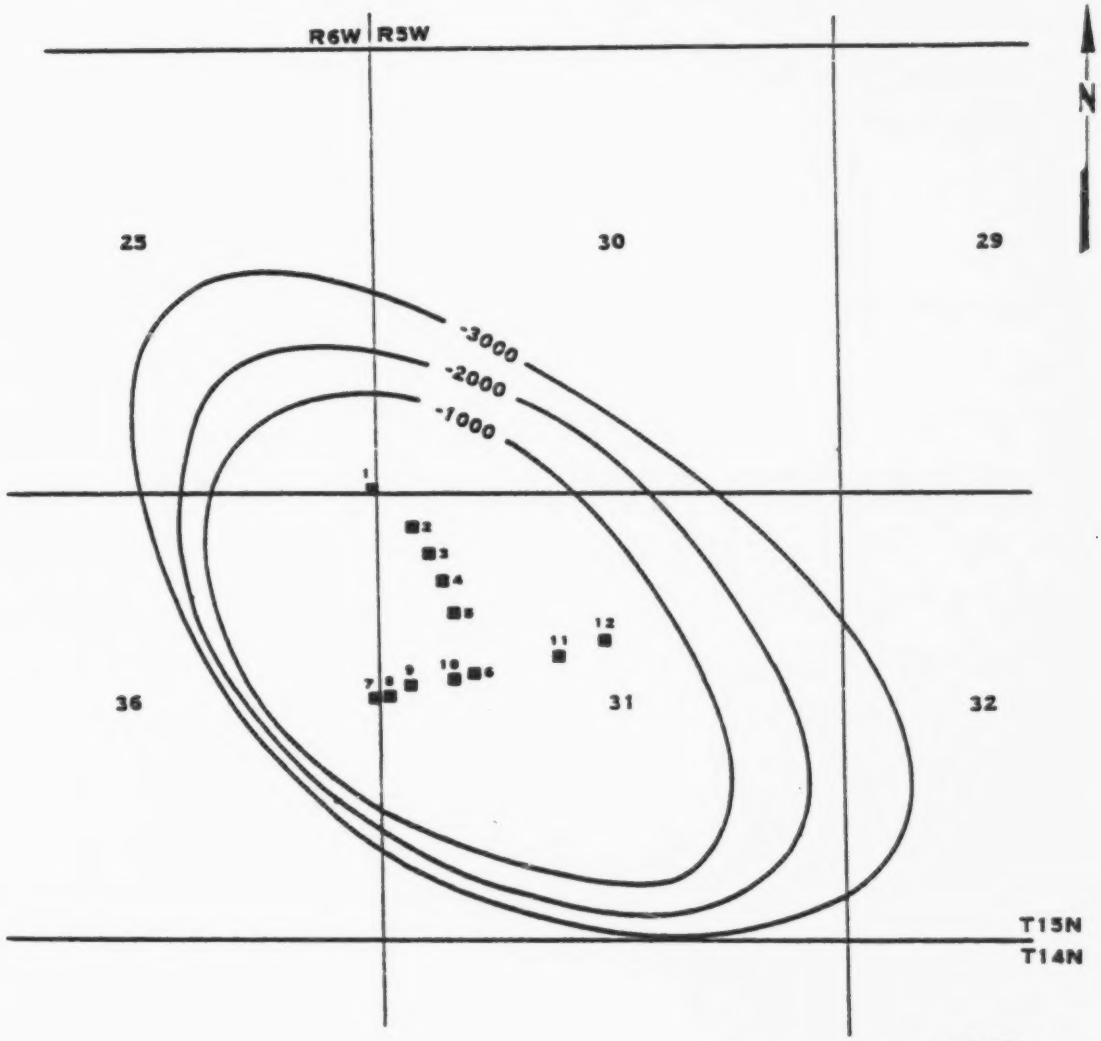


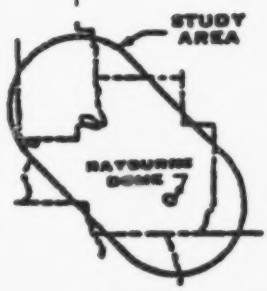
LEGEND

■6 GROUND LEVEL RESISTIVITY VERTICAL SOUNDING LRS-6

—-1000— INTERPRETED SALT CONTOUR - ELEVATION FEET MSL

NOTE

SEE TABLE E-1.1 FOR PSEUDOLOG REPRESENTATION OF VERTICAL SOUNDINGS



2000 0 2000 FEET

0.5 0 0.5 KILOMETER

PREPARED GHF DATE 2/17/87 REVISED ____ DATE ____ REVISED ____ DATE ____ APPROVED GHF DATE 2/17/87 T-1713-0	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA, GEORGIA	NORTH LOUISIANA STUDY AREA APPENDIX E-1 RAYBURNS DOME LOCATION MAP OF RESISTIVITY VERTICAL SOUNDINGS JOB NO. MV9700 FIGURE E-1.1

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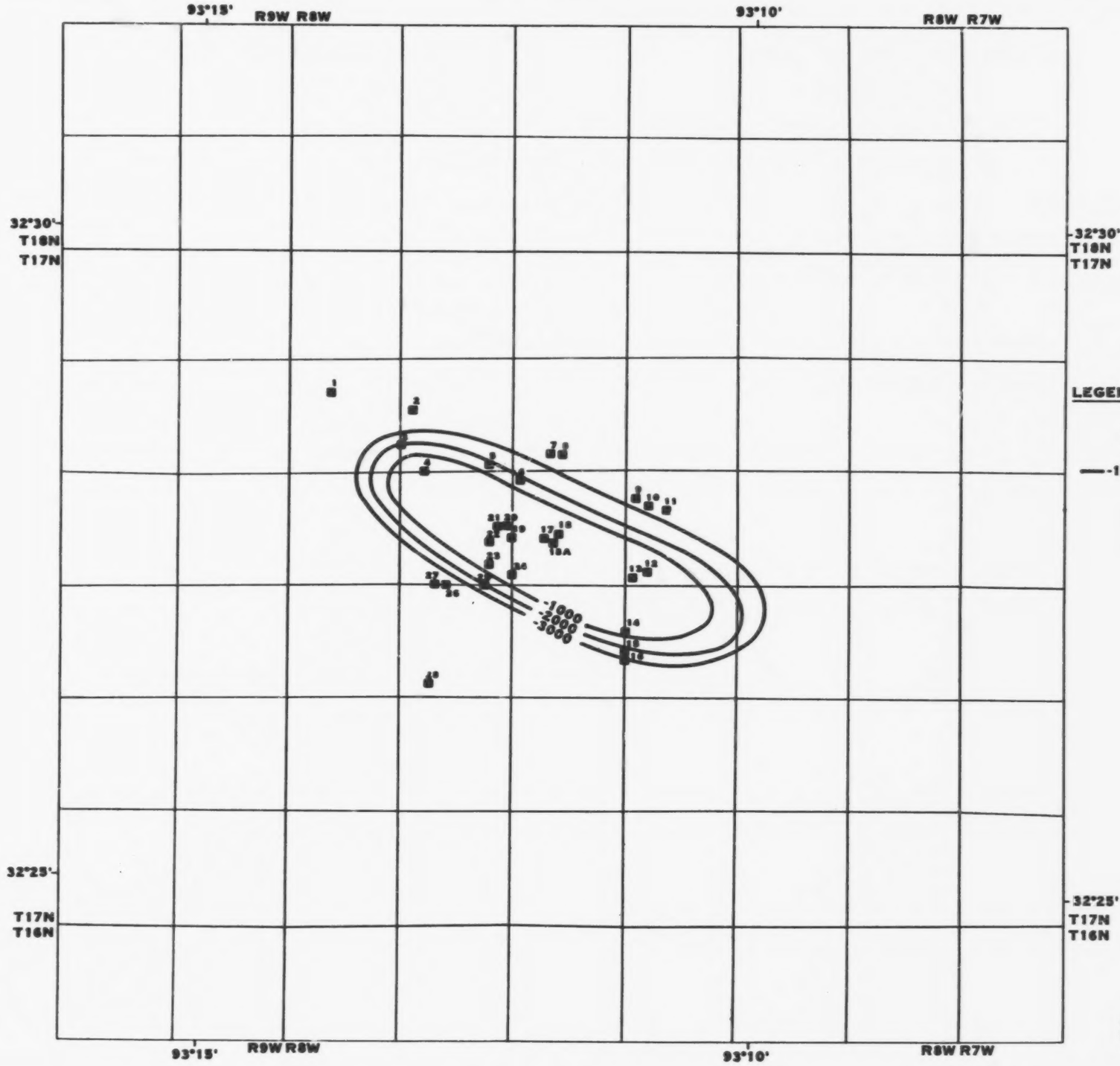

NORTH LOUISIANA STUDY AREA
APPENDIX E-1
VACHERIE DOME
LOCATION MAP OF RESISTIVITY VERTICAL SOUNDINGS
JOB NO. MV9700 FIGURE E-1.2

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA

PREPARED DATE 4/15/81
REVISED DATE
REVISED DATE 3/18/81
APPROVED DATE
T-1714-0

FIGURE E-1.2

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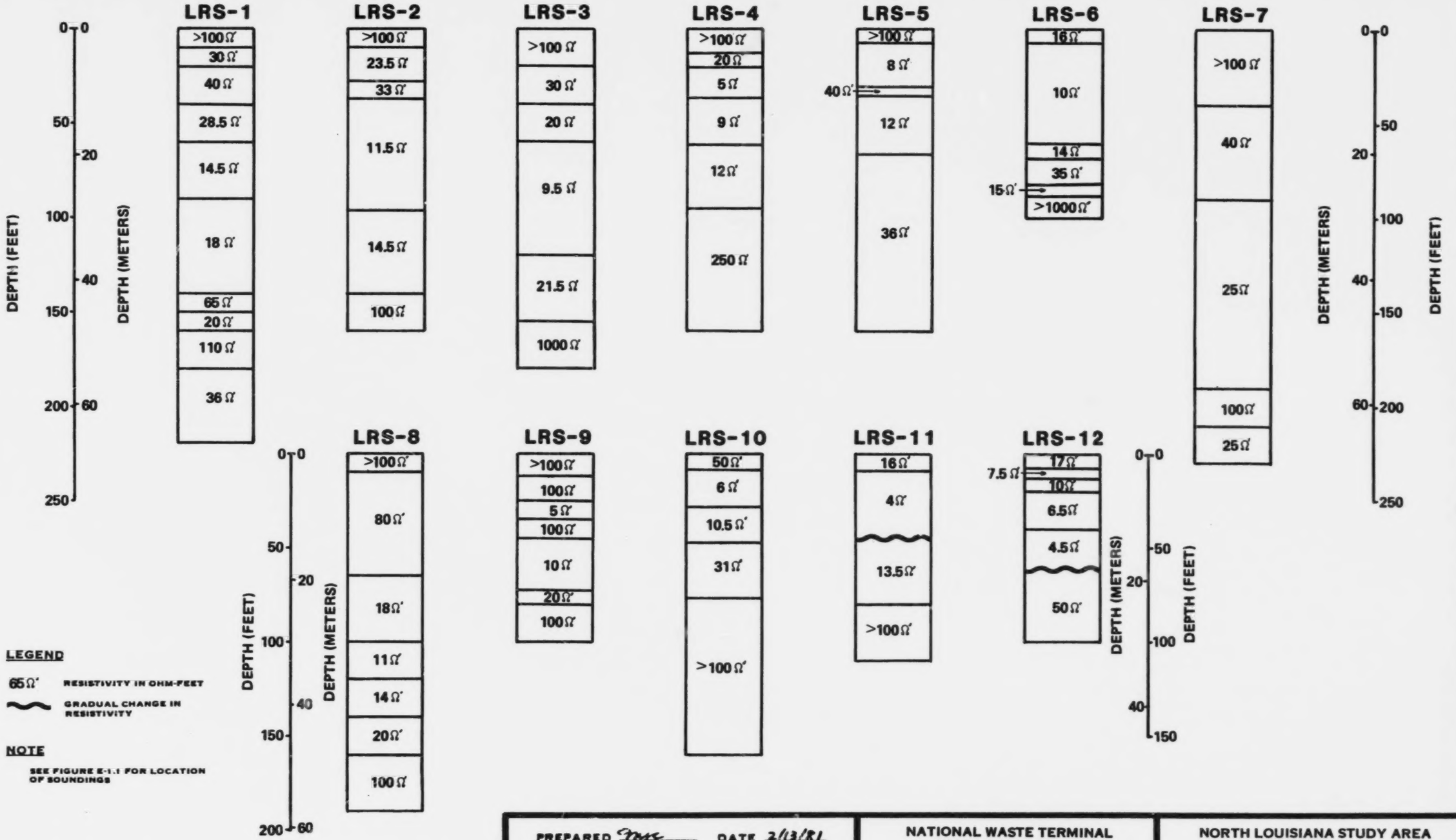

LEGEND

65Ω' RESISTIVITY IN OHM-FEET

GRADUAL CHANGE IN RESISTIVITY

NOTE

SEE FIGURE E-1.1 FOR LOCATION OF SOUNDINGS

PREPARED Hays	DATE 2/13/81	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA, GEORGIA	NORTH LOUISIANA STUDY AREA APPENDIX E-1 RAYBURNS DOME PSEUDOLOGS OF ELECTRICAL RESISTIVITY VERTICAL SOUNDINGS
REVISED	DATE		
REVISED	DATE		
APPROVED GHF	DATE 2/13/81		JOB NO. MV9700 TABLE E-1.1

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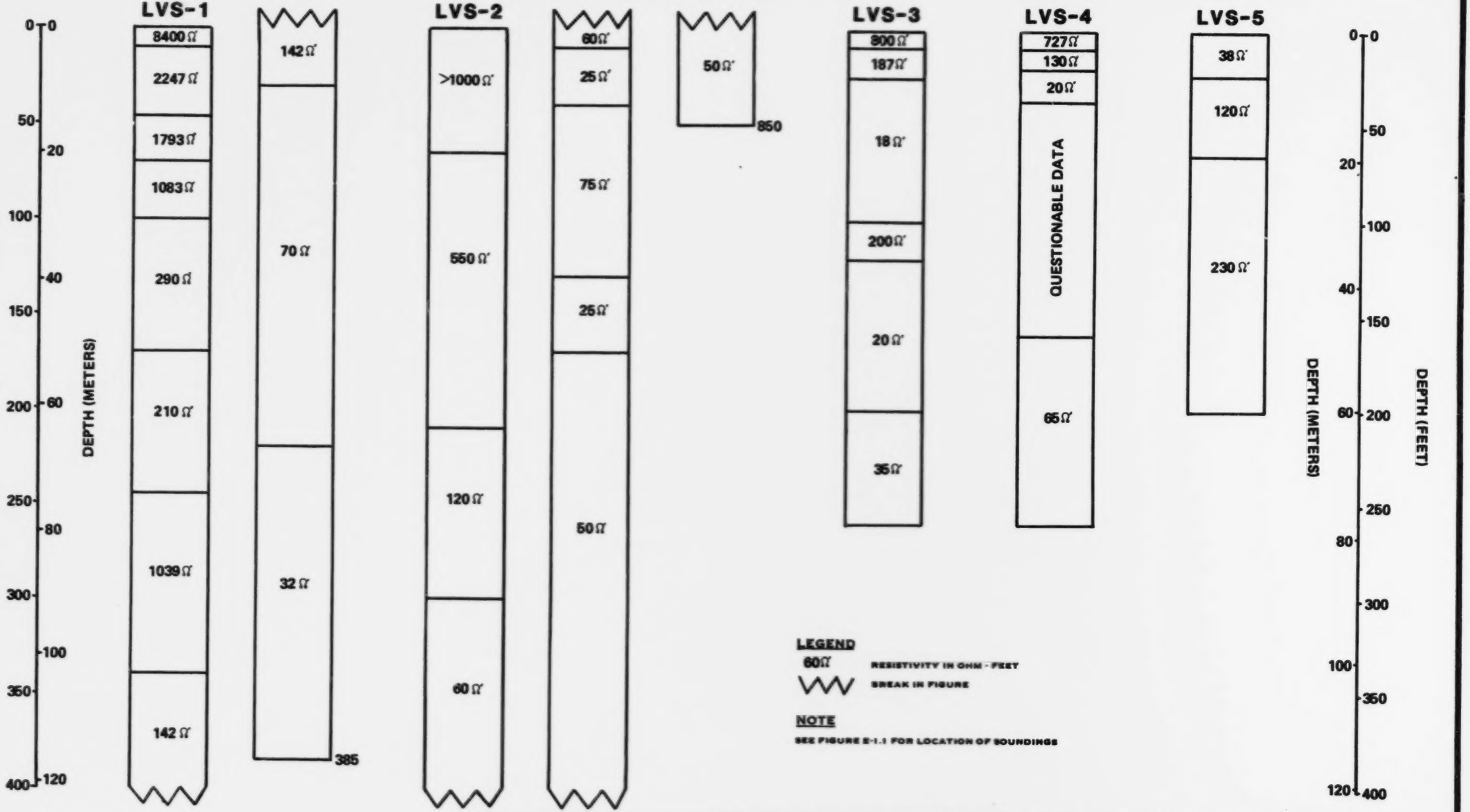

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REVISED	DATE	NORTH LOUISIANA STUDY AREA APPENDIX E-1 VACHERIE DOME PSEUDOLOGS OF ELECTRICAL RESISTIVITY VERTICAL SOUNDINGS
REVISED	DATE	
APPROVED GHF	DATE 3/13/81	

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JOB NO. MV9700 TABLE E-1.2 PAGE 1 OF 5

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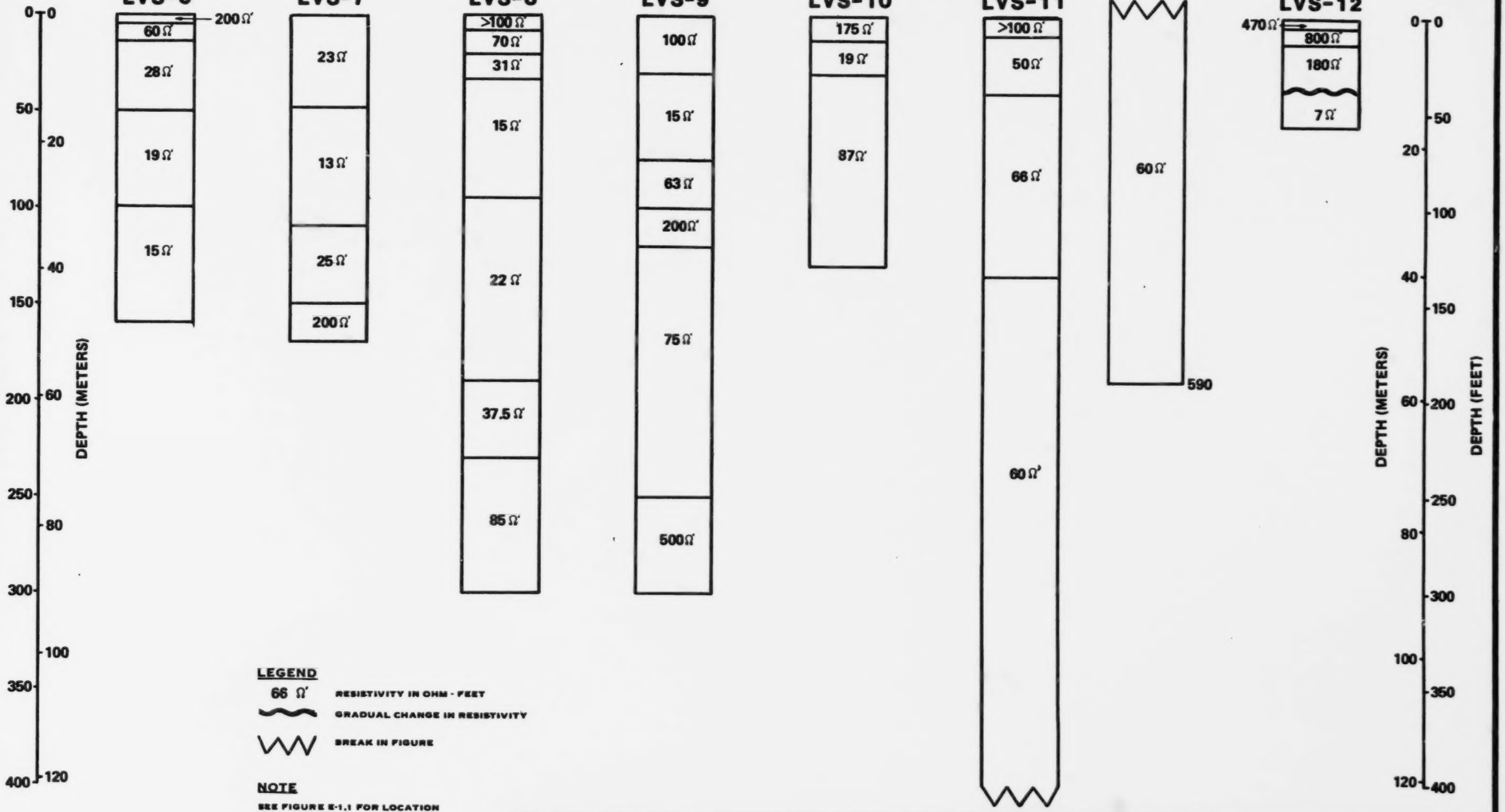

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LAW ENGINEERING TESTING COMPANY
MARIETTA, GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX E-1
VACHERIE DOME
PSEUDOLOGS OF ELECTRICAL RESISTIVITY VERTICAL SOUNDINGS
TABLE E-1.2
JOB NO. MV9700
PAGE 2 OF 5

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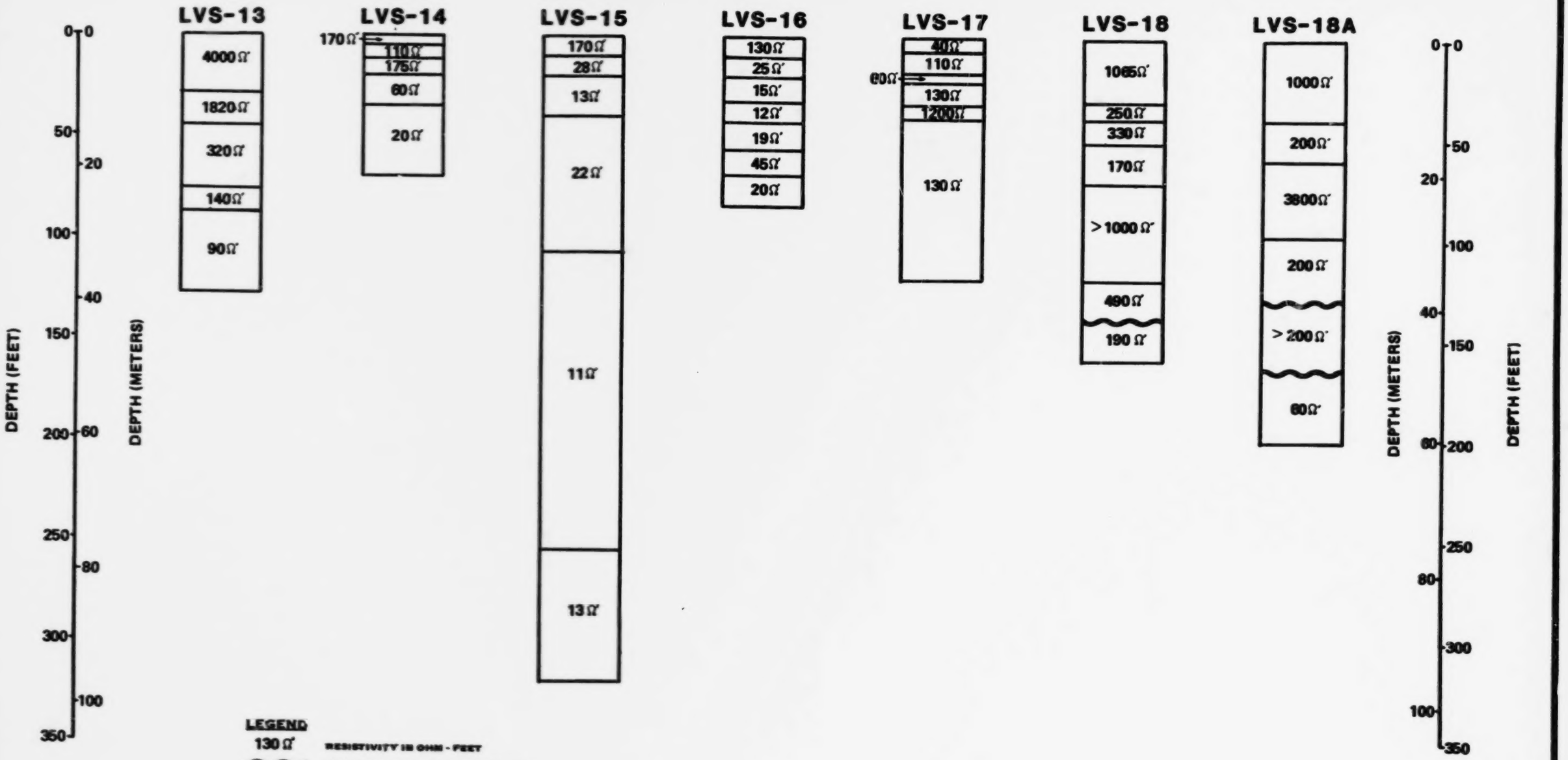

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130Ω — RESISTIVITY IN OHM - FEET

~~~ — GRADUAL CHANGE IN RESISTIVITY.

NOTE

SEE FIGURE E-1.1 FOR LOCATION OF SOUNDINGS

PREPARED	DATE 2/13/81	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA, GEORGIA
REVISED	DATE	
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NORTH LOUISIANA STUDY AREA
APPENDIX E-1
VACHERIE DOME
PSEUDOLOGS OF ELECTRICAL RESISTIVITY VERTICAL SOUNDINGS
JOB NO. MV9700
TABLE E-1.2
PAGE 3 OF 5

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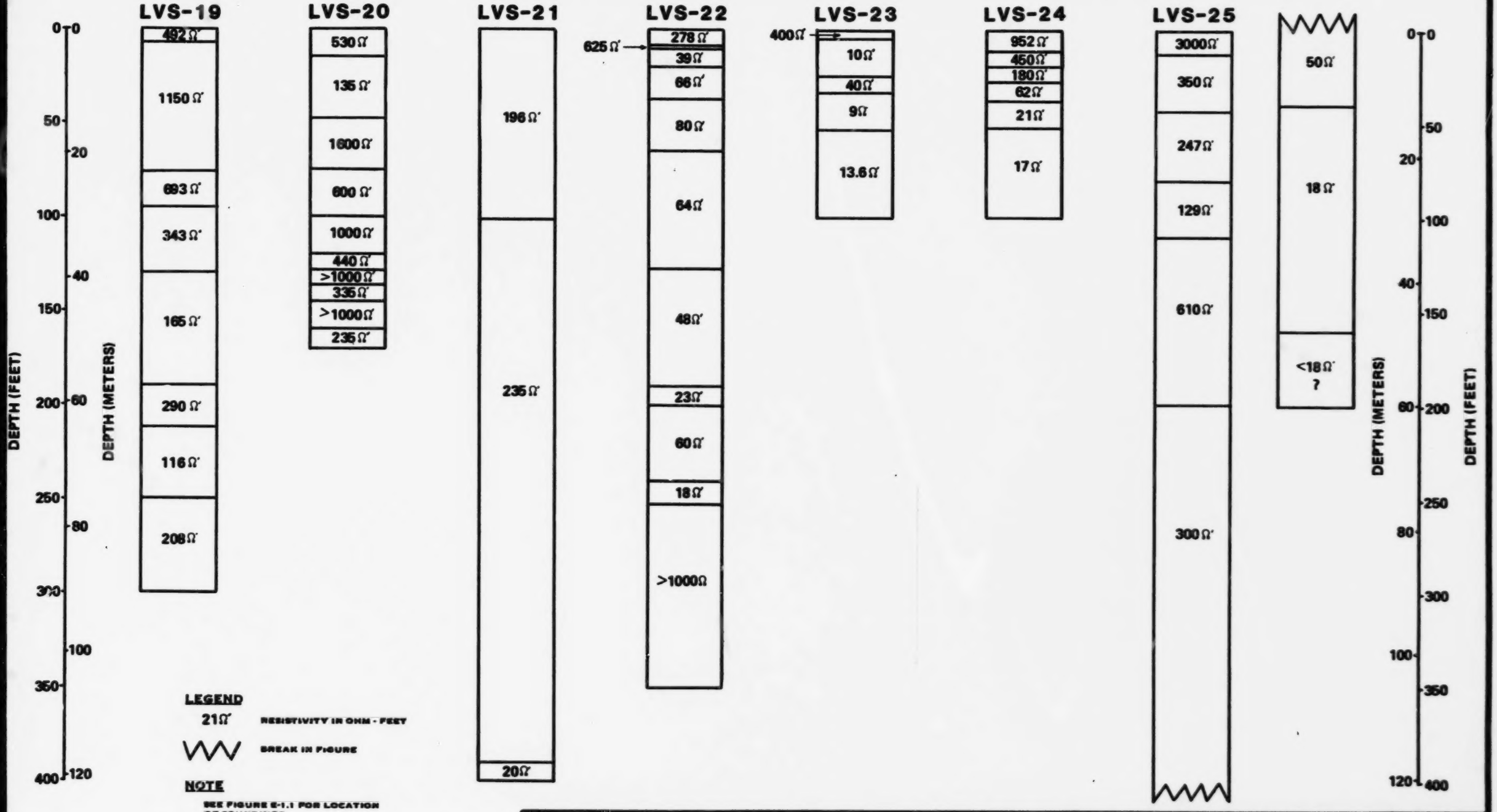

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NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
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NORTH LOUISIANA STUDY AREA
APPENDIX E-1
VACHERIE DOME
PSEUDOLOGS OF ELECTRICAL RESISTIVITY VERTICAL SOUNDINGS
JOB NO. MV9700
TABLE E-1.2
PAGE 4 OF 5

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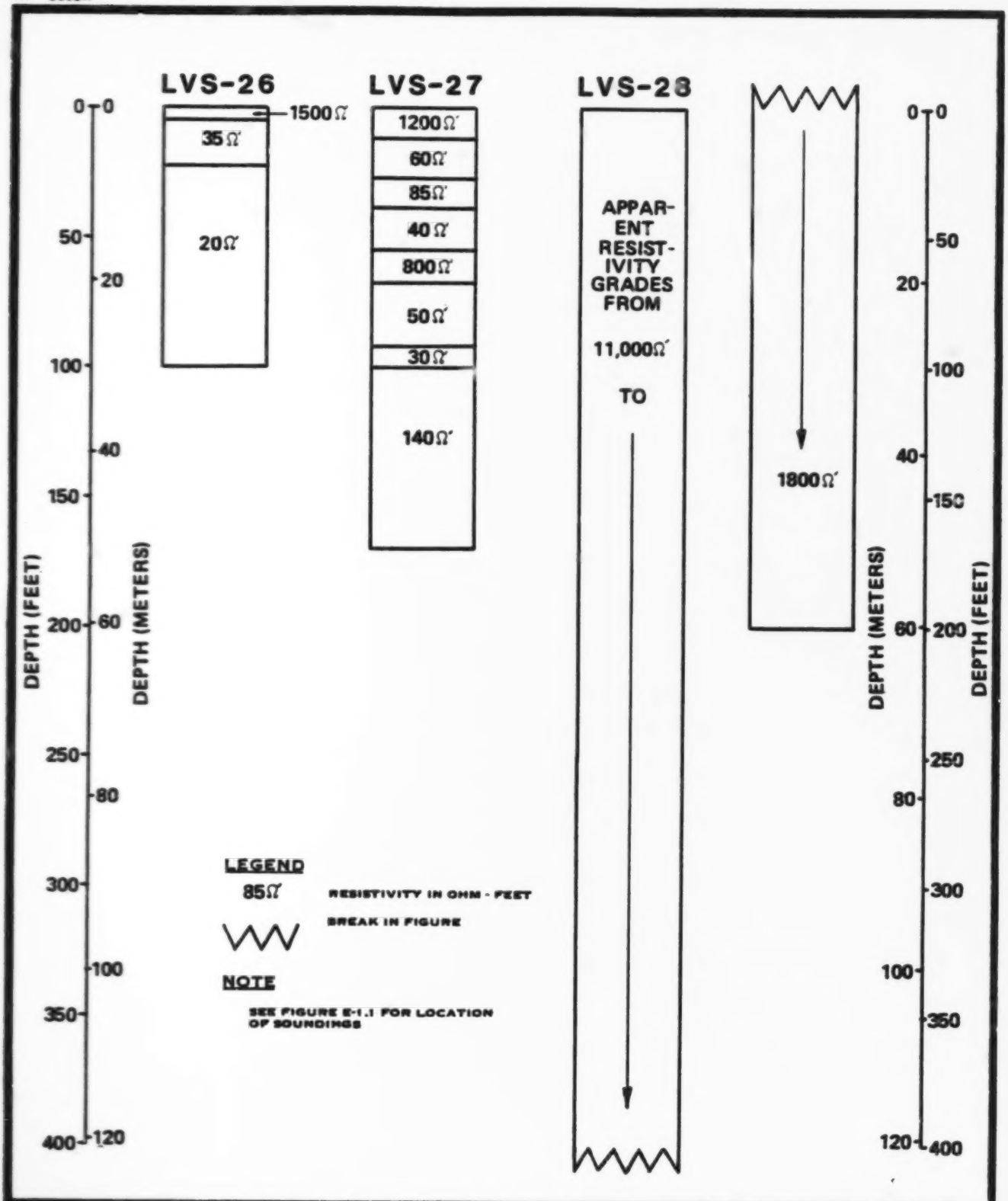

PREPARED [illegible] DATE 2/13/81 REVISED ____ DATE ____ REVISED ____ DATE ____ APPROVED GHE DATE 2/18/81 T-1748-0	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES LAW ENGINEERING TESTING COMPANY MARIETTA, GEORGIA	NORTH LOUISIANA STUDY AREA APPENDIX E-1 VACHERIE DOME PSEUDOLOGS OF ELECTRICAL RESISTIVITY VERTICAL SOUNDINGS JOB NO. MV9700 TABLE E-1.2 PAGE 5 OF 5

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NORTH LOUISIANA STUDY AREA

APPENDIX E-2

RESISTIVITY HORIZONTAL PROFILES

Ground-level electrical resistivity horizontal profiles were conducted by LETCo personnel in the areas adjacent to Rayburn's and Vacherie Domes in Louisiana to aid in the interpretation of the near-surface geology. The profiles were run concurrently with the resistivity vertical soundings (Appendix E-1). The work was performed with an A.B.E.M. Terrameter 4-cycle direct-current resistivity meter with the electrodes in a Wenner array. All work was done in accordance with LETCo Engineering Procedure No. 3.2, "Ground Level Resistivity Surveys-Data Collection". Most profiles were conducted with a 30-meter (100-ft) "a" spacing between electrodes.

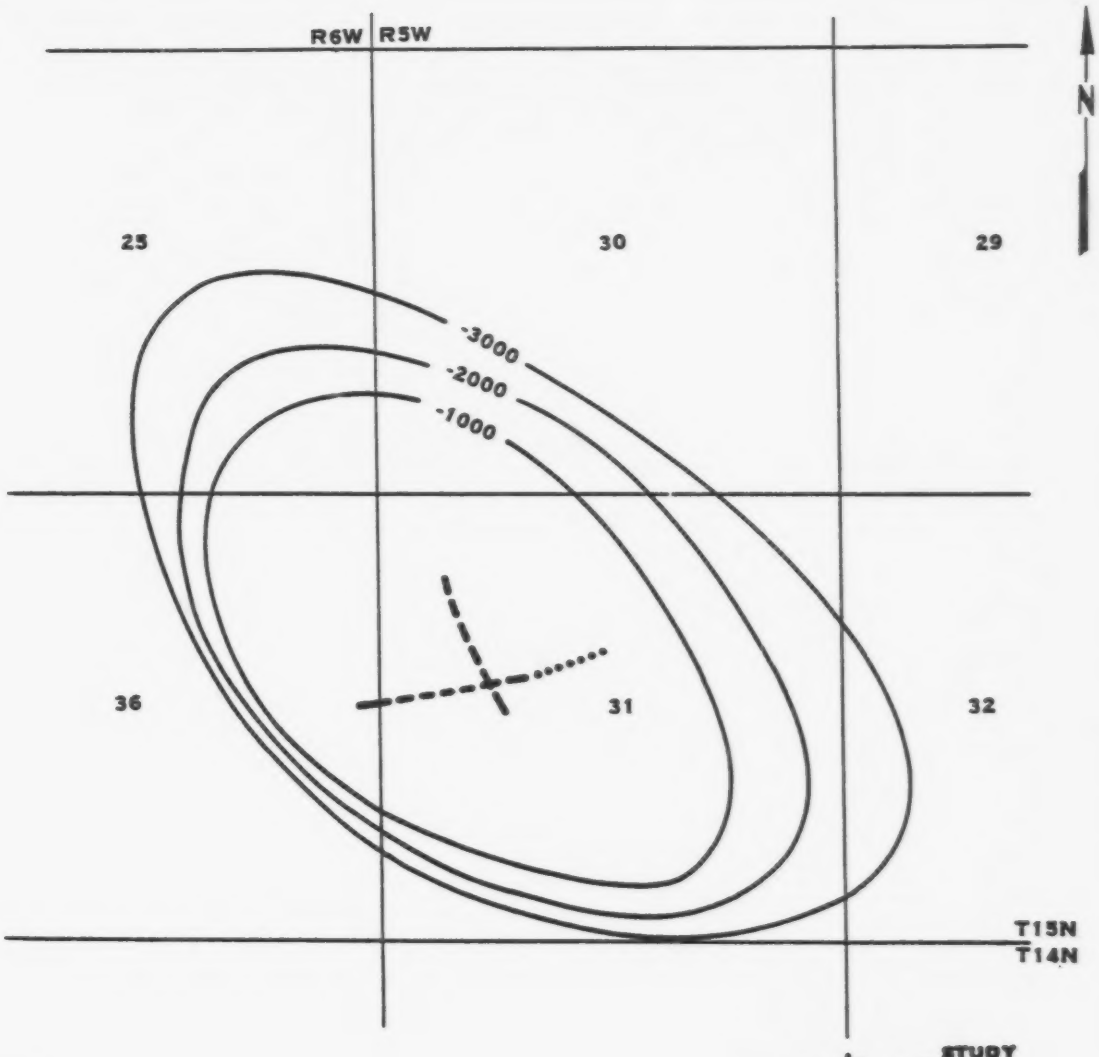
The measured resistivity value is an average of the resistivity of the materials through which the current flows and is known as the apparent resistivity. When only one material is present, the apparent resistivity is the true resistivity. Low apparent resistivities indicate the presence of clays, while a high apparent resistivity indicates the presence of sands and/or gravels. The resistivity value of each material is greatly dependent upon the porosity, the degree of saturation, and the chemical character of the pore fluid.

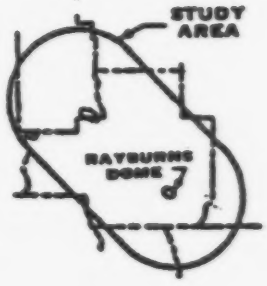
One thousand three hundred eleven meters (4,300 ft) of electrical resistivity profiles was conducted in the vicinity of Rayburn's Dome during the month of September, 1978 using a

30-meter (100-ft) "a" spacing, while 1,188 meters (3,900 ft) were conducted with a 15-meter (50-ft) "a" spacing. The locations of the profiles and smoothed apparent resistivity values are shown in Figure E-2.1.

Twenty-seven kilometers (16.5 mi) of electrical resistivity profiles were conducted in the area near Vacherie Dome between August, 1978 and April, 1979. The locations of the profiles and smoothed apparent resistivity values are shown in Figure E-2.2. Profiles were conducted during 1981 as part of surface geologic reconnaissance. The locations of these profiles are presented in a Law Engineering report entitled Surface Geological Reconnaissance of Vacherie Dome, Bienville, and Webster Parishes, Louisiana.

AF 12338A





LEGEND

- "LOW" APPARENT RESISTIVITY
- "MEDIUM" APPARENT RESISTIVITY
- "HIGH" APPARENT RESISTIVITY
- -1000 — INTERPRETED SALT CONTOUR-ELEVATION FEET MSL

2000 0 2000 FEET

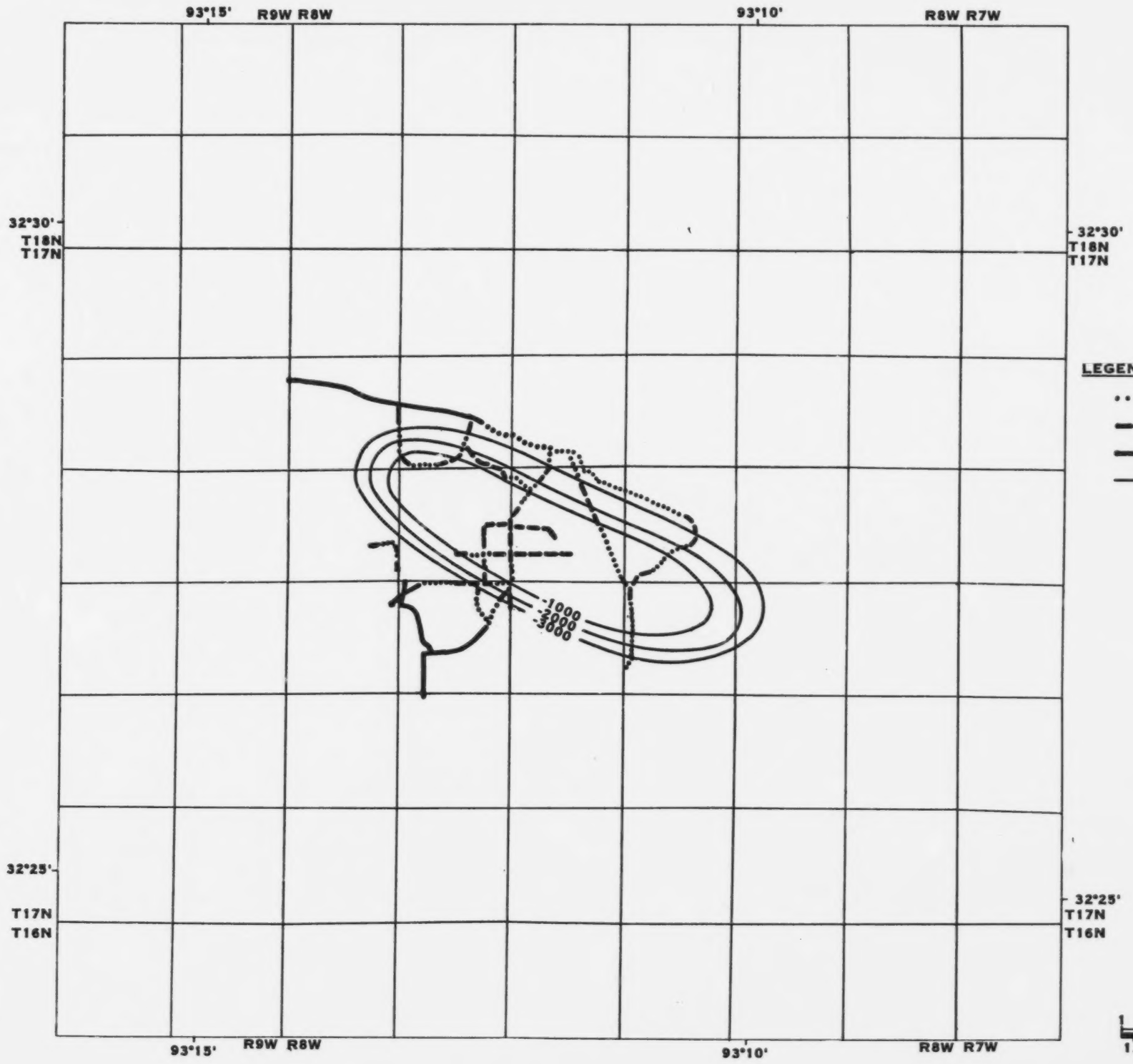
0.5 0 0.5 KILOMETER

PREPARED GHF DATE 2/13/81
REVISED ____ DATE ____
REVISED ____ DATE ____
APPROVED GHF DATE 2/19/81
T-1715-0

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES
LAW ENGINEERING TESTING COMPANY
MARIETTA GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX E-2
RAYBURNS DOME
LOCATION AND APPARENT RESISTIVITY MAP OF HORIZONTAL PROFILES
JOB NO. MV9700 FIGURE E-2.1

169 BEST DOCUMENT AVAILABLE



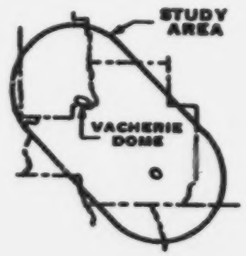
N

LEGEND:

- "LOW" APPARENT RESISTIVITY
- "MEDIUM" APPARENT RESISTIVITY
- "HIGH" APPARENT RESISTIVITY
- —1000— INTERPRETED SALT CONTOUR-ELEVATION FEET MSL

NOTE:

THE RESISTIVITY VALUES HAVE BEEN SMOOTHED TO ELIMINATE SMALL AREAS OF BORDERLINE VALUES. THE VALUES ARE BASED UPON A WENNER ARRAY, GENERALLY WITH A 100-FOOT "A" SPACING.



1 0 1 MILES

1.5 1 0.5 0 1.5 KILOMETERS

NORTH LOUSIANA STUDY AREA
APPENDIX E-2
VACHERIE DOME
LOCATION AND APPARENT RESISTIVITY MAP OF HORIZONTAL PROFILES
FIGURE E-2.2
JOB NO. MY9700

NATIONAL WASTE TERMINAL STORAGE PROGRAM
GEOLOGIC EVALUATION GULF COAST SALT DOMES

LAW ENGINEERING TESTING COMPANY MARIETTA, GEORGIA

PREPARED DATE 2/13/81
REVISED DATE
REVISED DATE 2/19/81
APPROVED GHF DATE
T-1716-0

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FIGURE E-2.2

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NORTH LOUISIANA STUDY AREA

APPENDIX E-3

NEAR-DOME GRAVITY

Gravity data over Rayburn's and Vacherie Salt Domes were acquired for the purpose of modeling dome shapes. Bouguer gravity values from previously measured stations were acquired and augmented by data from additional measurements collected for the Area Characterization study. The table below gives the number of gravity stations used for the interpretation of each dome:

Salt Dome	Existing Observations	Area Characterization Observations	Total Observations
Rayburn's	204	143	347
Vacherie	544	0	544

Bouguer gravity maps were prepared from the data (Figures E-3.1 and E-3.2). These are contour maps of gravity units that reflect both local and regional trends in the gravity data. Many of the purchased stations are proprietary data and although they were used in preparing the Bouguer maps, their locations were not available for publication. The regional trends, which are expressions of deep-seated structural features, were removed from the Bouguer map to produce a residual map. The dome shapes were modeled from the residual maps and other geological and geophysical data, including boring logs and seismic reflection surveys. All map preparation and modeling were done under subcontract to LETCo.

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R6W

R5W

T 15 N

14 N

BIENVILLE PARISH

WINN PARISH

NATCHITOCHES PARISH

LEGEND

72 / 38.75 — AREA CHARACTERIZATION GRAVITY OBSERVATION STATION WITH STATION NUMBER AND BOUGUER GRAVITY VALUE IN MILLIGALS.

O 45.75 — EXISTING GRAVITY OBSERVATION STATION WITH BOUGUER GRAVITY VALUE IN MILLIGALS

—44.0— CONTOUR LINE OF EQUAL BOUGUER VALUE. VALUE IN MILLIGALS

—3000— INTERPRETED SALT CONTOUR-ELEVATION FEET MSL

NOTE

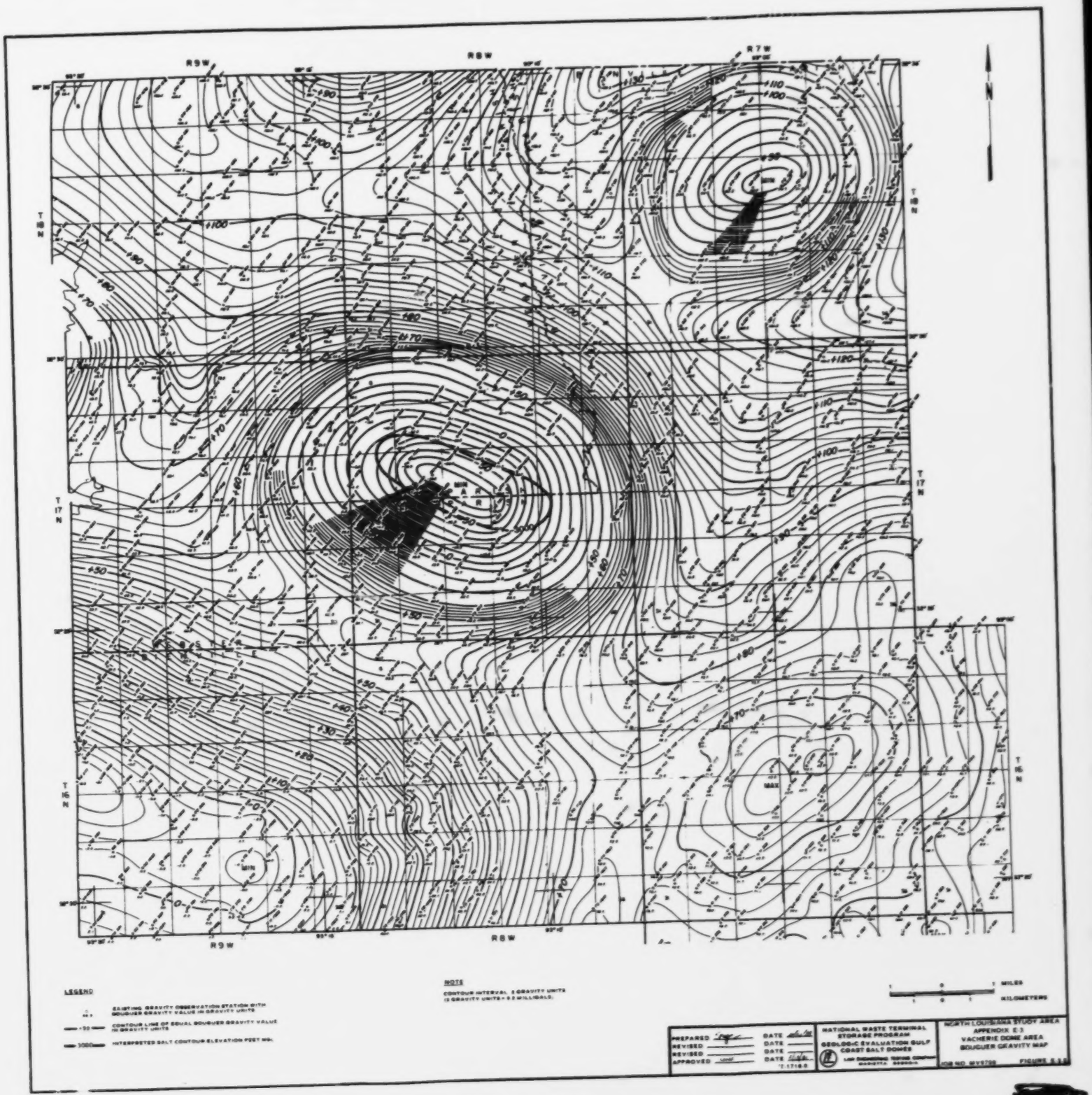
CONTOUR INTERVAL: 0.2 MILLIGALS

1 0 1 MILES

1 0 1 KILOMETERS

PREPARED	DATE 3/13/81	NATIONAL WASTE TERMINAL STORAGE PROGRAM GEOLOGIC EVALUATION GULF COAST SALT DOMES	NORTH LOUISIANA STUDY AREA APPENDIX E-3 RAYBURNS DOME AREA BOUGUER GRAVITY MAP
REVISED	DATE		
REVISED	DATE		
APPROVED	DATE 3/13/81	LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA	JOB NO. MV9700 FIGURE E-3.1

T-1717-0



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NORTH LOUISIANA STUDY AREA

APPENDIX E-4

HIGH-RESOLUTION SEISMIC DATA

No high-resolution seismic surveys were conducted in Louisiana during the Area Characterization phase of the Gulf Coast Salt Domes Project.

APPENDIX F

Microseismicity

NORTH LOUISIANA STUDY AREA

APPENDIX F-1

MICROSEISMIC DATA

Microseismic monitoring was conducted in the vicinity of both Vacherie and Rayburn's Domes prior to and during Area Characterization. For details, see the LSU/IES annual reports (Martinez and others, 1975, 1976, 1977, 1978, 1979).

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APPENDIX F-1

REFERENCES

Martinez, J. D., and others, 1975, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report ORNL-Sub-4112-10, 204 p.

Martinez, J. D., and others, 1976, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report ORNL-Sub-4112-15, 329 p.

Martinez, J. D., and others, 1977, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report Y/OWI/Sub-4112/37, 475 p.

Martinez, J. D., and others, 1978, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies Report EW-78-C-05-5941/53, 700 p.

Martinez, J. D., and others, 1979, An investigation of the utility of gulf coast salt domes for the storage or disposal of radioactive wastes: Louisiana State University, Institute for Environmental Studies, Annual Report, 572 p.

APPENDIX G

Seismicity

NORTH LOUISIANA STUDY AREA

APPENDIX G-1

SEISMICITY

A search of the Law Engineering earthquake files was performed to produce a table of earthquakes with Modified Mercalli intensities (MMI) of IV-V or greater within the region between 86° to 100° W longitude and 29° to 38° N latitude (Table G-1.1). The locations of the epicenters of these events are shown in Figure G-1.1.

The Law Engineering earthquake file is a compilation of earthquakes from the following sources:

(1) Department of Commerce, 1973, Earthquake History of the United States (Rev. through 1970), Washington, D.C.: Department of Commerce. 5 volumes.

(2) Moneymaker, Berlen C., 1954-1958, Earthquakes in Tennessee and Nearby Sections of Neighboring States. Journal of the Tennessee Academy of Science, v. 29-33 (exclusive).

(3) Coast and Geodetic Survey, 1928- , United States Earthquakes. Washington, D. C.: Government Printing Office. (Annual Publication)

(4) Magnetic Tape Chronological Sort 1900-1973, Earthquake Data File, National Geophysical and Solar-Terrestrial Data Center, Boulder, Colorado, Environmental Data and Information Service, National Oceanic and Atmospheric Administration, U. S. Department of Commerce

(5) U.S. Geological Survey, Preliminary Determination of Epicenters. (Monthly)

(6) Law Engineering Testing Company, Internal Reports, Marietta, Ga.

(7) Heigold, P. C., 1972, Notes on the Earthquake of September 15, 1972 in Northern Illinois. Urbana, IL: Illinois Geological Survey, Environmental Geology Notes 59.

(8) U.S. Geological Survey, Earthquakes of the United States. (Quarterly)

(9) Nuttli, Otto, 1974, Magnitude-Recurrence Relation for Central Mississippi Valley Earthquakes. Bulletin of the Seismological Society of America, v. 64, no. 4, p. 1189-1207.

(10) Bradley, E. A., and Bennett, T. J., 1965, Earthquake History of Ohio, BSSA, Vol. 55, No. 4, pp. 745-752

(11) Bollinger, Gilbert A., 1975, A Catalog of Southeastern United States Earthquakes, 1754-1974. Blacksburg, VA: Virginia Polytechnic Institute

(12) McClain, William C. and Myers, O. H., 1970, Seismic History and Seismicity of the Southeastern Region of the United States. Oak Ridge, TN: Oak Ridge National Laboratory

(13) U.S. Geological Survey, Earthquake Information Bulletin. (Bi-monthly)

(14) Docekal, Jerry, 1970, Earthquakes of the Stable Interior with Emphasis on the Midcontinent. Lincoln, NE: University of Nebraska, Dissertation, 2 volumes

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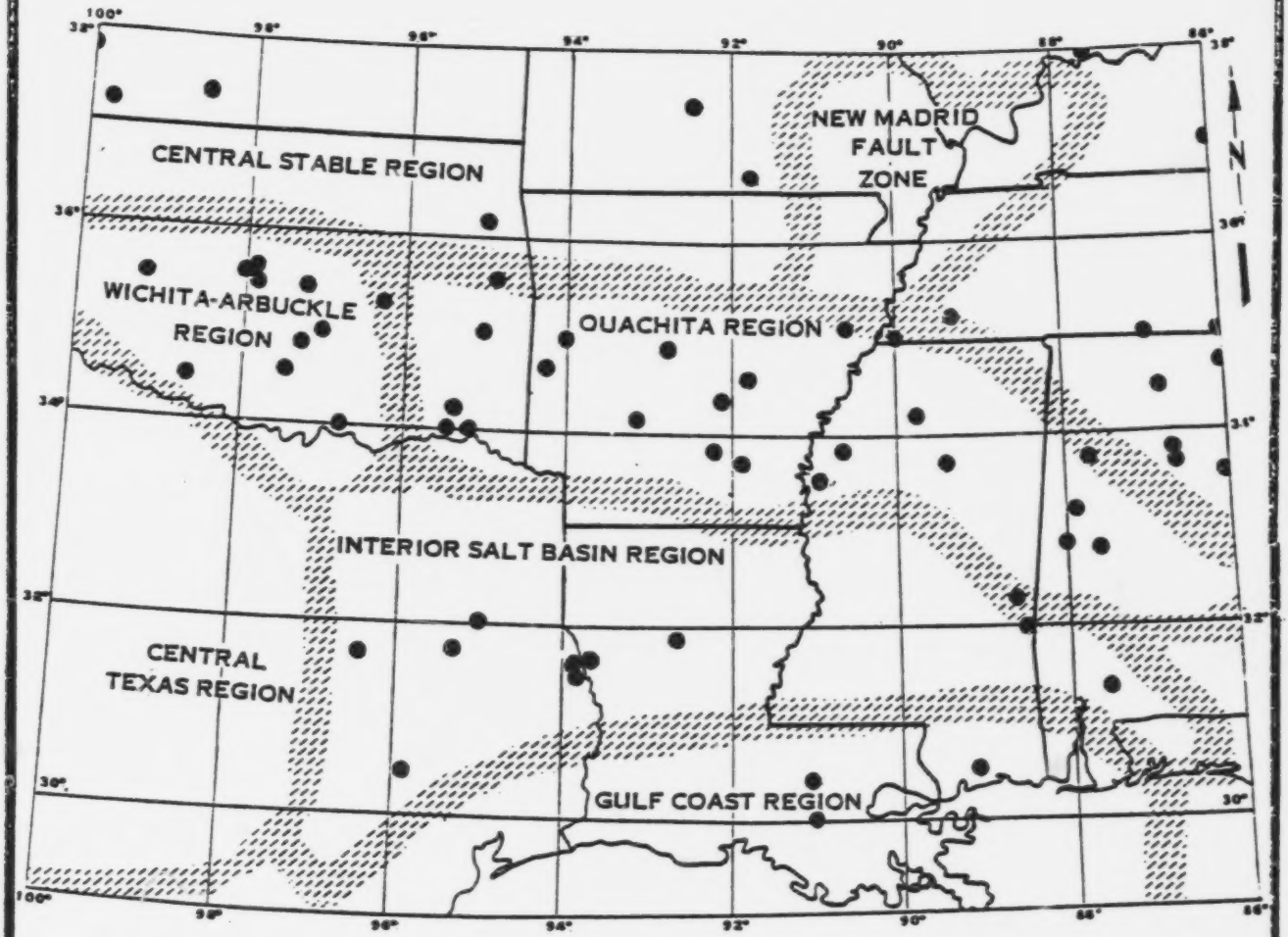

NOTES

THE EPICENTERS PLOTTED CORRESPOND TO EVENTS WITH MODIFIED MERCALLI INTENSITY OF IV - X OR GREATER

EPICENTERS WITHIN NEW MADRID FAULT ZONE HAVE NOT BEEN PLOTTED DUE TO HIGH DENSITY SPACING AND SCALE LIMITATIONS.

SEE TABLE G-1.1 FOR LIST OF EVENTS

LEGEND

SEISMO-TECTONIC REGION BOUNDARY

EARTHQUAKE EPICENTER (ONE OR MORE EVENTS)

100 0 100 MILES

160 0 160 KM

PREPARED LDG	DATE 12/22/81
REVISED	DATE
REVISED	DATE
APPROVED GHE	DATE 12/22/81

T-1594-1

NATIONAL WASTE TERMINAL STORAGE PROGRAM

GEOLOGIC EVALUATION GULF COAST SALT DOMES

LAW ENGINEERING TESTING COMPANY MARIETTA GEORGIA

NORTH LOUISIANA STUDY AREA
APPENDIX G-1
EPICENTRAL LOCATION MAP

JOB NO. MV9700 FIGURE G-1.1

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APPENDIX G-1

TABLE G-1.1 (PAGE 1 OF 9)

REGIONAL HISTORIC SEISMICITY
(Lat. 29°-38°N, Long. 86°-100°W)

YEAR	DATE	LOCAL TIME	MMI	LOCATION	LAT.	LONG.	FELT AREA (SQ.MI.)	REF.	REMARKS
1811	DEC. 16	02:00	XII	NEW MADRID, MO.	36.6	89.6	2000000	1	FELT TO THE EAST
1812	JAN. 23	09:00	XII	NEW MADRID, MO.	36.6	89.6		1	
1812	FEB. 7	03:45	XII	NEW MADRID, MO.	36.6	89.6		1	
1818	MARCH 1	00:00	IV-V	MISSISSIPPI VALLEY	35.0	90.0		2	*COORDS, DATE, TIME
1820	NOV. 9	16:00	IV-V	CAPE GIRARDEAU, MO.	37.3	89.5		1	
1834	NOV. 20	13:40	V	NORTHERN KENTUCKY	37.0	86.0		1	*COORDS
1841	DEC. 27	23:50	V	NEAR HICKMAN, KY.	36.4	89.2		1	*COORDS
1843	JAN. 4	20:45	VIII	EASTERN ARKANSAS	35.5	90.5	400000	9	INT. IX-X - REF.2
1855	MAY 2	21:33	IV-V	CAIRO, IL.	37.0	89.2		2	*COORDS
1856	NOV. 9	00:00	IV-V	IL., KY., TN.	37.0	89.0		2	*COORDS, TIME
1865	AUG. 17	09:00	VII	DYERSBURG, TN.	36.0	89.5	24000	9	
1878	MARCH 12	04:00	V	COLUMBUS, KY.	36.8	89.2		1	FELT LOCALLY
1878	NOV. 18	23:52	VI	SOUTHEASTERN MISSOURI	36.7	90.4	150000	1	INT. VI-VIII, REF. 2
1882	JULY 20	04:00	V	SOUTHERN ILLINOIS	38.0	90.0	3000	1	
1882	OCT. 22	16:15	VI-VII	ARKANSAS	35.0	94.0	135000	1	
1883	JAN. 11	01:12	VI	CAIRO, IL.	37.0	89.2	80000	1	
1883	APRIL 12	02:30	VI-VII	CAIRO, IL.	37.0	89.2		1	FELT LOCALLY
1883	JULY 14	01:30	IV-V	CAIRO, IL.	37.0	89.2		2	
1883	DEC. 5	09:20	V	IZARD CO., AR.	36.3	91.8		1	FELT LOCALLY
1886	FEB. 4	20:00	V	ALABAMA	32.8	88.0	1600	1	
1886	FEB. 13	00:00		ALABAMA	32.8	88.0		1	*TIME, INT.
1887	AUG. 2	12:36	V	CAIRO, IL.	37.0	89.2		1	WIDESPREAD EFFECTS
1889	JULY 19	19:32	VI	MEMPHIS, TN.	35.2	90.0		1	INT. V-VII, REF. 2
1891	JAN. 8	00:00	VII	ROSK, TX.	31.7	95.2		1	

*ESTIMATE

Y-1398A-0

APPENDIX G-1

TABLE G-1.1 (PAGE 2 OF 9)

REGIONAL HISTORIC SEISMICITY
(Lat. 29°-38°N, Long. 86°-100°W)

YEAR	DATE	LOCAL TIME	MMI	LOCATION	LAT.	LONG.	FELT AREA (SQ.MI.)	REF.	REMARKS
1891	JULY 26	20:28	VI	EVANSVILLE, IN.	37.9	87.5		1	
1891	SEPT. 26	22:55	V	CAIRO, IL.	37.0	89.2		2	*COORDS
1895	OCT. 31	05:08	IX	MISSOURI	37.0	89.4	1000000	9	INT. VIII, REF. 1
1895	OCT. 31	05:08	IX	MISSOURI	37.0	89.4	1000000	9	INT. VIII, REF. 1
1897	APRIL 30	22:00	IV-V	TENNESSEE AND ILLINOIS	36.0	89.0		1	*COORDS
1903	NOV. 27	03:20	V	NEW MADRID, MO.	36.5	89.5	70000	1	
1904	OCT. 27	00:00	V	KANSAS	37.7	100.0	2700	1	*TIME
1905	AUG. 21	23:08	VI	MISSISSIPPI VALLEY	36.0	90.0	40000	1	*COORDS
1907	JULY 4	03:00	IV-V	FARMINGTON, MO.	37.7	90.4	400	1	
1908	SEPT. 28	13:34	IV-V	NEW MADRID, MO.	36.5	89.5	5000	1	
1908	OCT. 27	18:27	V	CAIRO, IL.	37.0	89.2	5000	1	
1909	OCT. 23	01:10	V	SOUTHEASTERN MISSOURI	37.0	89.5	40000	1	INT. V-VI, REF. 2
1911	MARCH 31	10:57	V	BISON, AR.	33.8	92.2	18000	1	2 SHOCKS, 73 MIN. APART
1914	DEC. 29	19:00	IV-V	ANDERSON, TX.	30.5	95.9	70	3	
1915	APRIL 28	17:40	IV-V	NEW MADRID, MO.	36.4	89.5	200	1	
1915	OCT. 26	01:40	V	MAYFIELD, KY.	36.7	88.6		1	FELT LOCALLY
1915	DEC. 7	12:40	V-VI	NEAR MOUTH OF OHIO RIVER	36.7	89.1	60000	1	
1916	OCT. 18	16:04	VII	IRONDALE, AL.	33.5	86.2	100000	1	
1916	DEC. 18	23:42	I-VII	HICKMAN, KY.	36.6	89.3		1	FELT LOCALLY
1917	JUNE 29	20:23	V	ALABAMA	32.7	87.5		1	FELT LOCALLY
1918	SEPT. 10	10:30	V	EL RENO, OK.	35.5	98.0		1	FELT LOCALLY, AFTERSHOCKS
1918	OCT. 15	21:30	V	WESTERN TENNESSEE	35.2	89.2	20000	1	
1919	NOV. 3	14:40	IV-V	ARKANSAS	36.2	90.9		1	FELT LOCALLY
1922	MARCH 22	16:30	V	SOUTHERN ILLINOIS	37.3	88.6	25000	1	*COORDS, 2 SHOCKS

*ESTIMATE

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APPENDIX G-1

TABLE G-1.1 (PAGE 3 OF 9)

REGIONAL HISTORIC SEISMICITY
(Lat. 29°-38°N, Long. 86°-100°W)

YEAR	DATE	LOCAL TIME	MMI	LOCATION	LAT.	LONG.	FELT AREA (SQ.MI.)	REF.	REMARKS
1922	MARCH 23	15:45	V	WESTERN KENTUCKY	37.0	88.0		1	*COORDS
1922	MARCH 29	20:20	V	CENTRAL TENNESSEE	35.0	86.0		2	*COORDS
1922	MARCH 30	10:53	V	MISSISSIPPI VALLEY	35.2	90.6		2	
1922	NOV. 26	21:31	V	MISSISSIPPI VALLEY	37.0	90.5		2	*COORDS
1923	OCT. 28	11:10	VII	MARKED TREE, AR.	35.5	90.3	40000	1	
1923	NOV. 26	17:25	VI	MISSISSIPPI VALLEY	35.4	90.4		9	*COORDS
1923	DEC. 31	21:05	V	ARKANSAS	35.4	90.3	30000	1	
1924	MARCH 2	05:18	V	KENTUCKY	36.9	89.1	15000	1	
1925	APRIL 26	22:05	V	INDIANA	38.0	87.5	100000	1	
1925	MAY 13	06:00	V	KENTUCKY	36.7	88.6	3000	1	
1925	SEPT. 2	05:55	V-VI	HENDERSON, KY.	37.8	87.6	75000	1	
1926	JUNE 20	08:20	V	OK.-AK. BORDER	35.5	94.9	18000	14	
1927	MAY 7	02:28	VII	MISSISSIPPI VALLEY	36.5	89.0	130000	1	
1927	JUNE 16	07:00	V	SCOTTSBORO, AL.	34.7	86.0	2500	1	
1927	AUG. 13	10:00	V	MISSISSIPPI VALLEY	36.4	89.5		2	*COORDS
1929	NOV. 27		V	SOUTHERN KANSAS	37.2	99.7		4	
1929	DEC. 27	18:30	VI	EL RENO, OK.	35.5	98.0	8000	1	
1930	AUG. 29	00:27	V	KY., TN., IL., MO.	37.0	89.0		2	*COORDS
1930	OCT. 19	06:17	V-VI	DONALDSONVILLE, LA.	30.0	91.0	18000	6	
1931	MAY 5	07:18	V	CULLMAN, AL.	33.7	86.6	6500	3	INT. V-VI, REF. 1
1931	DEC. 16	21:36	VI	BATESVILLE, MS.	34.1	89.8	65000	3	INT. VI-VII, REF. 1
1932	APRIL 9	04:15	V	HEXIA, TX.	31.7	96.4	1000	3	
1933	AUG. 19	13:30	V	EL RENO, OK.	35.5	98.0	200	3	INT. VI, REF. 1
1933	DEC. 9	02:40	V	MANILA, AR.	35.8	90.2	100	3	INT. VI, REF. 1
1934	APRIL 11	11:40	V	TX.-OK. BORDER	33.9	95.5	3000	3	
1934	AUG. 19	18:47	VI	RODNEY, MO.	37.0	89.2	28000	3	INT. VII, REF. '

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APPENDIX C-1

TABLE C-1.1 (PAGE 4 OF 9)

REGIONAL HISTORIC SEISHICITY
(Lat. 29°-38°N, Long. 86°-100°W)

YEAR	DATE	LOCAL TIME	MMI	LOCATION	LAT.	LONG.	FELT AREA (SQ.MI.)	REF.	REMARKS
1936	MARCH 14	11:20	V	SOUTHEASTERN OKLAHOMA	34.0	95.2	900	3	
1937	MAY 16	18:50	IV-V	NORTHEASTERN ARKANSAS	36.1	90.6	25000	1	INT. III, REF. 3
1938	SEPT. 17	21:34	IV-V	NORTHEASTERN ARKANSAS	35.5	90.3	90000	1	INT. IV, REF. 3
1939	JUNE 19	15:43	V	ARKADELPHIA, AR.	34.1	93.1		3	FELT LOCALLY
1940	MAY 31	13:02	IV-V	OHIO RIVER	37.0	88.0	1000	2	*COORDS
1941	OCT. 18	01:48	V	BESSIE, OK.	35.4	99.0	100	12	
1941	NOV. 16	21:09	V-VI	COVINGTON, TN.	35.5	89.7		3	FELT LOCALLY, INT. V, REF.2
1947	SEPT. 20	15:30	IV-V	WINNFIELD, LA.	31.9	92.7		12	
1947	DEC. 15	21:27	V	NEAR OSCEOLA, AR.	35.5	90.0	10000	2	*COORDS
1949	JAN. 13	21:45	V	MISSISSIPPI VALLEY	36.4	89.5	7000	2	*COORDS
1950	FEB. 8	04:37	V	LEBANON, MO.	37.4	92.4		3	
1952	FEB. 20	16:35	V	TN.-MO. BORDER	36.4	89.5		3	
1952	APRIL 9	10:29	VII	EL RENO, OK.	35.4	97.8	140000	3	
1952	APRIL 16	00:05	V	EL RENO, OK.	35.4	97.8		3	
1952	JULY 16	17:48	VI	DYERSBURG, TN.	36.2	89.6		3	
1953	MARCH 17	07:12	VI	CONCHO, OK.	35.6	97.8		3	2 SHOCKS
1954	FEB. 2	10:53	VI	POPLAR BLUFF, MO.	36.7	90.3		3	
1954	APRIL 26	20:09	V	MEMPHIS, TN.	35.2	90.0		3	
1955	JAN. 25	01:24	VI	TN., AR., MO.	35.6	90.3	30000	3	
1955	FEB. 1	08:45	V	GULFPORT, MS.	30.4	89.1		3	
1955	MARCH 29	03:03	VI	FINLEY, TN.	36.0	89.5		3	
1955	SEPT. 5	19:45	V	FINLEY, TN.	36.0	89.5		3	
1955	DEC. 13	01:43	V	DYER CO., TN.	36.0	89.5		3	*TIME
1956	JAN. 6	05:58	VI	SOUTHERN KANSAS	37.3	98.5	16000	1	

*ESTIMATE

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APPENDIX G-1

TABLE G-1.1 (PAGE 5 OF 9)

REGIONAL HISTORIC SEISMICITY
(Lat. 29°-38°N, Long. 86°-100°W)

YEAR	DATE	LOCAL TIME	MMI	LOCATION	LAT.	LONG.	FELT AREA (SQ.MI.)	REF.	REMARKS
1956	JAN. 28	22:14	VI	TN.-AR. BORDER	35.6	89.6	11500	3	
1956	FEB. 16	17:30	VI	EDMOND, OK.	35.4	97.3		3	
1956	APRIL 2	10:03	V	SOUTHEASTERN OKLAHOMA	34.2	95.4		3	
1956	OCT. 29	03:24	V	CARUTHERSVILLE, MO.	36.1	89.4		3	
1956	OCT. 30	04:36	VII	NORTHEASTERN OKLAHOMA	36.2	95.0	3700	3	
1956	NOV. 25	22:13	VI	WAYNE CO., MO.	37.1	90.6	21500	3	
1957	MARCH 19	10:38	V	NORTHEASTERN TEXAS	32.0	95.0	10100	3	*COORDS, 4 SHOCKS
1957	MARCH 26	02:27	V	PADUCAH, KY.	37.0	88.4		3	FELT LOCALLY
1957	APRIL 23	04:24	VI	BIRMINGHAM, AL.	34.5	86.8	11500	3	
1958	JAN. 26	10:56	V	MEMPHIS, TN.	35.2	90.0		3	FELT LOCALLY
1958	JAN. 27	23:57	V	IL.-KY.-MO. BORDER	37.0	89.0	300	3	
1958	APRIL 8	16:26	V	OBION CO., TN.	36.2	89.1	400	3	
1958	APRIL 26	01:30	V	LAKE CO., TN.	36.3	89.5		3	
1958	NOV. 19	12:15	V	BATON ROUGE, LA.	30.3	91.1		3	FELT LOCALLY
1959	FEB. 13	02:37	V	BOGOTA, TN.	36.2	89.5	170	3	
1959	JUNE 15	06:45	V	SEMINOLE CO., OK.	35.0	97.0		3	*COORDS
1959	JUNE 17	04:27	VI	SOUTHWESTERN OKLAHOMA	34.5	98.5	12000	3	
1959	AUG. 12	13:06	VI	AL.-TN. BORDER	35.0	87.0	2800	3	
1959	DEC. 21	10:25	V	FINLEY, TN.	36.0	89.5	400	3	
1960	JAN. 28	15:38	V	DYER CO., TN.	36.0	89.5		3	FELT LOCALLY
1960	APRIL 21	04:45	V	LAKE CO., TN.	36.3	89.5		3	FELT LOCALLY
1961	JAN. 10	19:40	V	SOUTHEASTERN OKLAHOMA	35.0	95.0		3	*COORDS
1961	APRIL 27	01:30	V	SOUTHEASTERN OKLAHOMA	35.0	95.0		3	*COORDS, TIME
1962	FEB. 2	00:44	VI	NEW MADRID, MO.	36.5	89.6	35000	3	

*ESTIMATE

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APPENDIX C-I

TABLE C-1.1 (PAGE 6 OF 9)

REGIONAL HISTORIC SEISMICITY
(Lat. 29°-38°N, Long. 86°-100°W)

YEAR	DATE	LOCAL TIME	MMI	LOCATION	LAT.	LONG.	FELT AREA (SQ.MI.)	REF.	REMARKS
1962	JUNE 26	19:29	V	SOUTHERN ILLINOIS	37.7	88.5		3	
1962	JULY 23	00:05	VI	SOUTHERN MISSOURI	36.1	89.8		3	
1963	MARCH 3	11:30	VI	SOUTHEASTERN MISSOURI	36.7	90.1	100000	3	
1963	JULY 8	17:52	V	SOUTHEASTERN MISSOURI	37.0	90.5		4	*INT.
1963	AUG. 2	18:38	V	IL.-KY. BORDER	37.0	88.8		3	
1964	JAN. 16	23:10	VI	SOUTHEASTERN MISSOURI	36.8	89.5		4	*INT.
1964	APRIL 23	19:21	V	WESTERN LOUISIANA	31.5	93.8		3	
1964	APRIL 24	01:34	V	WESTERN LOUISIANA	31.6	93.8		3	
1964	APRIL 27	18:31	V	WESTERN LOUISIANA	31.5	93.8		3	
1964	APRIL 28	15:19	V	WESTERN LOUISIANA	31.7	93.6		3	
1964	MAY 23	05:26	V	SOUTHEASTERN MISSOURI	36.5	90.0		4	*INT.
1964	MAY 23	09:01	VI	SOUTHEASTERN MISSOURI	36.5	89.9		4	*INT.
1964	AUG. 16	05:36	V	HEMPHILL, TX.	31.4	93.8		3	
1965	FEB. 10	21:40	VI	SOUTHEASTERN MISSOURI	36.4	89.7		4	*INT.
1965	AUG. 13	23:46	VI	SOUTHWESTERN ILLINOIS	38.3	89.5		3	*INT.
1965	AUG. 14	07:14	VII	SOUTHWESTERN ILLINOIS	37.1	89.2		3	
1965	AUG. 15	00:07	V	SOUTHWESTERN ILLINOIS	37.4	89.5		3	2 SHOCKS
1965	OCT. 20	20:05	VI	EASTERN MISSOURI	37.8	91.0	160000	3	
1965	NOV. 4	01:44	V	SOUTHEASTERN MISSOURI	37.1	91.0		4	*INT.
1965	DEC. 19	16:19	VII	NORTHEASTERN ARKANSAS	35.9	89.9		4	*INT.
1966	FEB. 13	17:20	V	SOUTHEASTERN MISSOURI	37.1	91.0		4	*INT.
1966	FEB. 26	02:10	V	SOUTHEASTERN MISSOURI	37.2	91.0		4	*INT.
1967	JUNE 4	10:14	VI	GREENVILLE, MS.	33.6	90.9	25000	3	
1967	JUNE 29	07:57	V	GREENVILLE, MS.	33.6	90.9		3	

*ESTIMATE

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TABLE G-1.1 (PAGE 7 OF 9)

REGIONAL HISTORIC SEISMICITY
(Lat. 29°-38°N, Long. 86°-100°W)

YEAR	DATE	LOCAL TIME	MMI	LOCATION	LAT.	LONG.	FELT AREA (SQ.MI.)	REF.	REMARKS
1967	JULY 21	03:15	VI	SOUTHEASTERN MISSOURI	37.5	90.4		3	
1968	FEB. 9	19:35	V	SOUTHEASTERN MISSOURI	36.5	89.9		3	*INT.
1968	OCT. 14	08:43	VI	DURANT, OK.	34.0	96.8		3	
1968	NOV. 9	11:02	VII	SOUTHERN ILLINOIS	38.0	88.5	580000	3	
1969	JAN. 1	17:36	VI	CENTRAL ARKANSAS	34.8	92.6	23000	3	
1969	MAY 2	05:33	V	EASTERN OKLAHOMA	35.2	96.3	13000	3	
1970	MARCH 26	21:44	V	SOUTHEASTERN MISSOURI	36.5	89.7		3	*INT.
1970	NOV. 16	20:14	VI	ARKANSAS	35.9	89.9	78000	3	
1971	MARCH 14	11:28	V	CARROLLTON, AL.	33.1	87.9		3	*INT.
1971	OCT. 1	12:50	V	NORTHEASTERN ARKANSAS	35.8	90.4	55000	3	
1972	JAN. 31	23:42	V	NORTHEASTERN ARKANSAS	36.4	90.8		3	
1972	MARCH 29	14:39	V	NEW MADRID, MO.	36.2	89.6	65800	3	
1973	JAN. 7	16:56	V	KENTUCKY	37.4	87.3		3	*INT.
1973	JAN. 8	03:12	V	MISSISSIPPI	33.8	90.6		5	*INT.
1973	JAN. 12	05:57	V	EASTERN MISSOURI	37.9	90.5		5	*INT.
1973	MAY 25	08:40	V	MISSISSIPPI	33.8	90.6		3	*INT.
1973	DEC. 20	04:45	V	NEW MADRID, MO.	36.2	89.6		5	*INT.
1974	JAN. 7	19:13	V	NEW MADRID, MO.	36.2	89.4		5	*INT.
1974	FEB. 15	16:36	V	ARKANSAS	34.1	93.1		5	SEVERAL WEAKER SHOCKS
1974	FEB. 24	01:54	V	ARKANSAS	35.8	90.4		5	*INT.
1974	MARCH 4	08:24	V	ARKANSAS	35.7	90.4		5	*INT.
1974	MARCH 9	22:34	IV-V	NEW MADRID, MO.	36.2	89.5		5	*INT.
1974	MARCH 12	06:30	V	TENNESSEE	35.7	89.8		5	*INT.
1974	MAY 13	00:52	VI	NEW MADRID, MO.	36.7	89.4	800	8	

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TABLE C-1.1 (PAGE 8 OF 9)

REGIONAL HISTORIC SEISMICITY
(Lat. 29°-38°N, Long. 86°-100°W)

YEAR	DATE	LOCAL TIME	MMI	LOCATION	LAT.	LONG.	FELT AREA (SQ.MI.)	REF.	REMARKS
1974	AUG. 11	08:30	V	FREMONT, MO.	36.9	91.2		5	
1974	DEC. 10	00:02	V	SOUTHWESTERN ALABAMA	31.3	87.5		8	
1974	DEC. 12	23:04	V	NORTHEASTERN ARKANSAS	34.7	91.9		8	
1975	FEB. 13	13:44	V	NEW MADRID, MO.	36.5	89.6		3	
1975	JUNE 13	16:40	VI	NEW MADRID, MO.	36.5	89.7		5	
1975	JUNE 24	05:12	IV-V	ALABAMA	33.7	87.8		3	
1975	JULY 6	02:48	IV-V	NEW MADRID, MO.	36.2	89.5		5	*INT.
1975	AUG. 20	03:14	IV-V	NEW MADRID, MO.	36.6	89.8		5	*INT.
1975	AUG. 24	18:44	IV-V	EASTERN MISSOURI	37.2	90.9		5	*INT.
1975	AUG. 24	21:01	IV-V	EASTERN MISSOURI	37.2	90.9		5	*INT.
1975	AUG. 25	01:11	V	NEW MADRID, MO.	36.1	89.8		5	*INT.
1975	AUG. 28	22:23	VI	NORTHERN ALABAMA	33.8	86.6	10000	3	
1975	OCT. 11	21:58	V	OKLAHOMA	34.8	97.4		5	*INT.
1975	NOV. 29	08:30	VI	FOSTER, OK.	34.5	97.4		3	
1975	DEC. 2	21:01	VI	NEW MADRID, MO.	36.5	89.6		3	
1976	MARCH 24	18:41	VI	ARKANSAS	35.6	90.5		3	
1976	APRIL 15	01:04	V	KENTUCKY	37.4	87.3		5	
1976	MAY 22	01:41	V	NEW MADRID, MO.	36.0	89.8		3	
1976	SEPT. 25	08:07	V	ARKANSAS	35.6	90.4		3	
1976	OCT. 22	18:41	V	MISSISSIPPI	32.2	88.7		5	*INT.
1976	DEC. 13	02:36	V	EASTERN MISSOURI	37.8	90.2		3	
1977	JAN. 3	16:57	VI	CAPE GIRARDEAU, MO.	37.6	89.8		8	
1977	MAY 3	20:00	V	MISSISSIPPI	32.0	88.4		8	
1977	JUNE 2	17:29	VI	ARKANSAS	34.6	94.2		8	*INT.

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TABLE G-1.1 (PAGE 9 OF 9)

REGIONAL HISTORIC SEISMICITY
(Lat. 29°-38°N, Long. 86°-100°W)

YEAR	DATE	LOCAL TIME	MMI	LOCATION	LAT.	LONG.	FELT AREA (SQ.MI.)	REF.	REMARKS
1977	NOV. 4	05:21	V-VI	ROCKY MOUNT, MS.	33.8	89.3		5	
1978	AUG. 30	18:31	V	DYERSBURG, TN.	36.1	89.4		5	
1978	SEPT. 23	01:33	V	ARKANSAS	33.7	91.9		5	
1978	DEC. 10	20:07	V	MISSISSIPPI	32.0	88.5		8	
1979	FEB. 27	02:25	V	JEFFERSON CO., AR.	34.4	92.1		13	
1979	FEB. 27	16:55	V	STRAWBERRY, AR.	35.9	91.3		13	
1979	MARCH 13	22:37	V	OKLAHOMA	35.5	97.8		8	
1979	JUNE 10	23:12	V	TN.-MO. BORDER	36.2	89.6		13	
1979	JUNE 25	12:11	V	POINSETT CO., AR.	35.6	90.4		13	
1979	NOV. 5	10:35	V	MO.-AR. BORDER	36.5	91.0		13	

*ESTIMATE

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